UNIVERSITY OF ALBERTA

EXPLANATORY STYLE AND ABSOLUTE PERFORMANCE IN COLLEGE MALE BASKETBALL PLAYERS

BY

KENNETH ALLAN LARSON ©

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Arts.

DEPARTMENT OF PHYSICAL EDUCATION AND RECREATION STUDIES

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T3A 2R9

October 3, 1997

UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled "Explanatory Style and Absolute Performance in College Male Basketball Players", submitted by Kenneth Allan Larson in partial fulfillment of the requirements for the degree of Master of Arts.

John M Hogg
Dr. John Hogg

Garry Smith
Dr. Garry Smith

Dr. Dave Sande

M Bouffard
Dr. Marcel Bouffard

August 27/97

To my wife Terri, and daughter Nicole, for putting up with the long nights and short time we spent together while this was in progress.

ABSTRACT

A modified version of the Sport Attributional Style Scale was used to measure subjects' explanatory style (*N* = 129) in relation to free throw shooting in basketball. Subjects were found to be more optimistic than pessimistic. Subjects were found to perform better at shooting free throws in practice than in games. When subjects who attempted less shots in competitions were eliminated (*N* = 68), the optimism index and internality for positive events correlated positively, while the pessimism index and stability for negative events correlated negatively.

Regression models were employed to determine which SASS elements were influential in accounting for variance in free throw shooting. In the practice environment, it can be concluded that internality for positive events, externality for negative events and instability for negative events account for the greatest variance. In the competitive scenario, it can be concluded that externality of negative events and uncontrollability of negative events accounted for the greatest degree of variance.

Explanatory style was not found to be correlated with free throw performance until the criterion group was extracted. In addition to this finding, explanatory style correlated more with free throws in the practice setting than in the competitive setting.

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Chapter 1

INTRODUCTION

Statement of the Problem

Sport psychologists and coaches from all sports are always in need of more pertinent information about the athlete. In their efforts to assist athletes in reaching their potential, coaches and sport psychologists seek new information that will allow them to better facilitate the breakdown of potentially "limiting factors" within the athlete. By gathering and understanding how athletes tend to cope with perceived failure in sport, coaches and sport psychology practitioners can work to develop sound cognitive intervention strategies and psychological skills training programs. Studies that shed light on these individual and group tendencies, although relatively thorough, require further investigation into the area of "absolute" performance and the effect these tendencies may have on future performance.

Traditionally, sport attribution research has focused predominantly on attributions made immediately after a perceived negative or positive event. This antecedent-attribution approach was a focus of attribution research until the mid 1980s when research studies shifted concern toward the examination of the attribution-consequence relation (Brawley, 1984). The attribution-consequence concept suggests that attributions are made with a certain individual style and are relatively trait oriented. Of particular concern is the type of style or tendency athletes carry with them from event to event. The approach in this study was of an antecedent-attribution-consequence nature.

Research studies in the area of attribution and sport have utilized a limited variety of approaches and instruments to better understand how athletes habitually explain to themselves the reasons why both good and bad events occur to them. The problem lies in the limited body of research studies in applied sport psychology that deal with attributional tendencies of athletes, to what degree they carry these tendencies with them to the next encounter, and how they manifest themselves in future performance opportunities. What remains to be explored and examined are attempts to remove the limitations of subjectivity and perception, and determine how attributional style affects "absolute" performance. More specifically, how can information from studies of this nature better equip sport psychologists and coaches with the tools they require to understand what the athlete is cognitively perceiving when faced with failure? And, how will these athletes carry this experience with them through to subsequent performance opportunities?

Few studies have examined the concept of environmental influence and its effects on performance in different settings. The problem is that the majority of the research, when dealing with a performance factor, simulate performance in a laboratory setting. This approach has limited ecological validity, and does not provide coaches and sport psychology practitioners relevant information when translating the results into the practical scenario. More specific information needs to be generated in order for transference to occur.

Purpose of the Study

The primary purpose of this study was to examine the relationship between the psychological construct of explanatory style and free throw shooting performance in college male basketball players. The secondary purpose of the study was to examine the concept of environment and its effects on the interaction of free throw shooting performance and explanatory style.

Explanatory style (synonymous with attributional style) is measured by the Sport Attributional Style Scale - SASS (Hanrahan, Grove & Hattie, 1989). In determining explanatory style, the major outcome is an estimation of a person's level or kind of pessimism or optimism, following a perceived negative or positive performance in a general sport setting. Specifically, the SASS yields 20 different measurements along seven basic dimensions - locus of control, stability, globality, controllability, intentionality, importance, and image clarity.

The basic prediction of the theory of explanatory style is that individuals who tend to be more optimistic than pessimistic, will tend to be more successful (Seligman, Nolen-Hoeksema, Thornton & Thornton, 1990). The sport specific version of the theory echoes the general theory. Seligman (1991) expanded the theory and postulated that the optimist will tend to be more resilient and recover more readily after a perceived poor performance. This person will tend to perform better than the pessimist in the next given opportunity (Seligman, 1991; Buchanan & Seligman, 1995). As can be anticipated, the converse of this theory states that the pessimist will be less resilient, and will display a tendency to perform relatively poorly in the next given opportunity.

The primary intent of this study was to replicate previous findings that the general phenomenon is supported in the sport setting. The specific objective was to relate explanatory style with specific, absolute performance in the sport of basketball within two relatively different environments. The independent variable was be represented by the scores and scales produced by the SASS. The dependent variable consisted of subjects' performance in the skill of free throw shooting, within the sport of basketball. Specifically, free throw data was measured, gathered, and converted to percentages in both practice and competitive environments. Free throw shooting was selected because it is a relatively closed skill within an open skilled sport.

This study also attempted to corroborate evidence from previous findings that the social, situational and personal factors affecting the attribution-consequence relation do exist in the sport setting. Within this analysis, the study examined the two different environments where free throw shooting takes place. The first section involved performance data in the practice environment. The second section involved performance data in the competitive environment. Thirdly, this study examined the construct of explanatory style and the dimensions and variables that comprise the SASS questionnaire.

Previous research studies have revealed that specific dimensions of the SASS are more relevant than others - those that are commonly selected as being salient to the individual, as well as those that account for the most variance in performance (Anderson, 1991; Anderson & Deuser, 1991). Statistical models that have been selected will allow replication of these research findings with respect to the variables that traditionally emerge as significantly accountable for variance in performance. Furthermore, this study attempted to establish parsimony - accounting for the greatest amount of variance in free throw shooting performance, with the minimal number of SASS elements.

Research Questions

As a result of the review of literature, the questions generated for the purposes of this study are well substantiated within the theoretical framework.

1. Dependent Variable - Free Throw Shooting Performance
    (a) How do college male basketball players score on free throw shooting?
        - in the practice environment?
        - in the competitive environment?
2. Independent Variable - Explanatory Style
    (a) How do college male basketball players score on the Sport Attributional Style Scale?
3. Multivariate Questions
    (a) How does explanatory style relate to free throw performance?
        - in the practice environment?
        - in the competitive environment?

    (b) Which explanatory style variables account for the most variance in free throw shooting performance?
        - in the practice environment?
        - in the competitive environment?

The corollary goal of the questions in 3(b) involves establishing parsimony - what are the fewest number of variables that will account for the greatest amount of variability in free throw shooting performance in each of the environmental settings?

Theoretical Perspective

Heider (1958) pioneered the area of attribution research. His initial tenet was that it is the explicit intent of all individuals to explain their own behaviour via their perceived causes. Since then, several researchers (Abramson et al., 1989; Anderson & Jennings, 1980; Jones & Davis, 1965; Kelley, 1967, 1971, 1973; Weiner, 1972, 1974, 1979, 1985a, 1985b) have taken the construct into several different directions spanning a variety of areas of the human experience (e.g. achievement, depression, emotion, sport). Although these and other researchers have worked from the basic theory, each has revealed a specific viewpoint or angle that has allowed the area to evolve into a more applied approach.

Of particular theoretical importance is the notion of perception. It is the underlying and most basic assumption surrounding attribution theory. Several authors (Bird, Foster & Maruyama, 1980; Ickes, 1980; Tenenbaum & Furst, 1985) have found that individuals' perceptions of success are distinct from the objective information provided by the outcome (Hanrahan, 1995). Limitations stem from the finding that a seemingly objective view of success (e.g. winning) can sometimes be perceived by the individual as being negative. The individual may have been part of a team that won a contest, but they perceived themselves individually as having not played well. In other words, the person may not perceive all losses as failures and all wins as successes. Hanrahan, in her review of attributional research (1995), strongly suggested that objective measures of performance remain out of research. Cox (1994) suggested the reason behind this recommendation was that researchers have not found an indicator of performance that effectively bridges the gap between subjective perception of the actor, and the objective view of the absolute performance. Cox continued to argue against the use of objective measures by stating it is the subjective view of the performance that is relevant.

Spink and Roberts (1980) showed that ambiguity of outcome can inherently cause inconsistent attributions made by individuals in both the group and individual scenarios. McAuley (1985) showed that perception of performance in gymnasts greatly influenced their causal ascriptions. This study made the assumption that the very nature of the free throw in basketball removes this ambiguity better than other areas of measure in previous studies to date. The free throw is a closed skill with a very clear and objective element of success attached. In a basketball game, there are inherent pressures associated with the free throw revolving around the intent on making every shot in order to assist the team effort. Whereas on the practice court, the free throw shooting climate is typically "created" by the coach, to varying extents, to be a competitive situation in order to best simulate the competitive environment. Unless the individual subject blatantly views the result has having no significant consequence, the outcome of the attempted free throw can only be seen in one dimension - positive or negative. The subject's perception of the outcome of a free throw in basketball will be difficult to confuse. Perception of the outcome as viewed by the actor and the absolute outcome will essentially become one in the same. This will assist in minimizing and controlling for the perception issue.

Anderson and Deuser (1993), through a functional approach, suggested that specific dimensions of attributional style are more salient than others. Their review of the literature to date shows that locus of control and controllability account for the majority of open-ended responses given by subjects after an event. Anderson (1991) indicated the existence of globality, stability and intentionality, but at a minimal level. This study, through correlation and multiple regression analyses, examined this concept.

Definitions

1. *Attribution theory* is a cognitive approach to motivation in which perceived causation plays an important role in explaining behaviour. It assumes that people habitually strive to explain, understand and predict events based on their cognitive perception of them (Cox, 1994). It is described as how individuals attribute the causes of perceived events (Heider, 1958; Kelley, 1967; Weiner, 1972).
2. *Explanatory style* is the construct of concern in this study. It is defined by Seligman (1991) as being the habitual way people tend to explain the causes of both good and bad events (the term is synonymous with attributional style). For the purposes of this study, the good and bad events presented in the Sport Attributional Style Scale (SASS) are positive and negative events in the sport of basketball. The positive and negative events being measured as the dependent variable are successful and unsuccessful free throws in the practice and competition environments.
3. *Pessimism* is described as being an overall negative view of past, present and future events. It is comprised of three base dimensions: locus of control, stability and globality. It is parallel to a particular explanatory style profile termed "depressive attributional style" (Abramson et al., 1989).
4. *Optimism* is described as a characteristic explanatory style profile that is reflected in an overall positive (or non-negative) outlook on past, present and future events. It is comprised of the same base dimensions as pessimism. A person with a SASS profile of this nature is said to have resistance to depression. This profile is shown to be characteristic of successful individuals (Seligman, 1991).

5. *Stability* is the attributional dimension that suggests that a cause or outcome will either change or remain stable. It is the dimension representing the degree to which individuals tend to attribute events as having temporary or long-lasting causes.
6. *Globality* is the attributional dimension that represents the degree to which individuals attribute events as having global or specific causes. It is the dimension representing the degree to which individuals feel that causes and/or outcomes are going to affect other areas of their lives.
7. *Internality* is the attributional dimension representing the degree to which individuals attribute events as being a result of internal or external causes - derived from Rotter's (1966) locus of control theory (in Hanrahan, 1995). It is the dimension representing the degree to which individuals feel that a cause or outcome is due to them personally, or something outside them.
8. *Controllability* is the attributional dimension in which perceived causes for events are seen as either within or beyond the person's control. It is the degree to which individuals perceive they are in control, or not in control, of the situation and/or event.
9. *Intentionality* is the attributional dimension reflecting the degree to which individuals perceive the causes of the event as being intentional or unintentional.
10. *Importance* is the attributional dimension reflecting the degree to which individuals place importance on the event being presented.
11. *Image clarity* is the attributional dimensions reflecting the degree to which individuals can clearly imagine the event being presented.
12. *Learned helplessness* is a condition in which individuals feel they have little or no control over their failures, and that subsequent failure is inevitable. The reformulated

model (Abramson et al., 1978) postulates that individuals who exhibit internal, stable and global tendencies toward explaining bad events will be predisposed to helplessness and ultimately depression.

13. The *self-serving hypothesis* states that an individual may exhibit a tendency to make irrational and/or illogical attributions to either enhance or protect one's ego.

Delimitations

1. The subjects involved in the study are male only. It is true that gender differences have been shown to exist (Carron, 1984; Hanrahan & Grove, 1989). For the purposes of this study, gender will not be a factor. The sport of basketball has been chosen because of personal interest to the researcher. The SASS is reported as being valid for persons within the sample age group - between 18 and 22 years of age.
2. For the practice portion of the study 100 free throw attempts have been selected as the performance criteria. This will ensure a sufficient number of attempts to allow for the construct's postulated effect.
3. For the competitive portion of the study, a minimum number of 30 free throw attempts was the performance criteria for selection. Less than 30 attempts indicate the athlete does not play regularly. A low number of free throw attempts, spread over the 20 game, five month schedule, can potentially contaminate a study because the obtained percentages are unstable. This was a mechanism for increasing validity of the results.
4. Free throw data consisted of the total number of shots attempted, the total number of shots made, and the overall ratio of successful to unsuccessful shots, recorded as a percentage (e.g. if a subject attempts 152 shots throughout the season, and makes 106

of them, the percentage is 69.73%). This data was collected and analysed for both the practice and competitive environments. Data generated in the practice environment is very different in context from that which occurs in games. In the practice scenario, the pressure surrounding the free throw is "simulated". In the game setting, the pressure is perceived by the individual differently because there are additional factors present that cannot be effectively duplicated in the practice setting (e.g. the presence of an opponent, officials, spectators, significant others, as well as the importance of the outcome and the level of uncertainty). Both scenarios are relevant to this study.

5. Every attempt to standardize the administration of the SASS has been made. The time of the season for all subjects to complete the SASS was consistent. The instructions from the original SASS were utilized. The coaches package contained explicit instructions on how to administer the SASS as well as collecting the free throw performance data in the practice environment.

Limitations

1. Reliability of the SASS is noted in the review of literature. Acceptable levels of reliability exist for this instrument. To attempt to control the potential reliability limitation, the SASS was administered at the beginning of the season before any competitions took place - measures of success or failure. This may indeed be the most stable period of explanatory style within the athletes. If the SASS were administered at the conclusion of the season, those teams and individuals that won may be affected differently than those teams and individuals that lost. All teams were subjected to the SASS at the same time frame of the season - prior to any competitions. As a result,

relative consistency can be assumed.

2. Validity of the SASS is noted in the review of the literature. This instrument has solid criteria and construct validity support. Its application to sport has been shown with significant results (Hanrahan, 1995).
3. The researcher, with consent from the original authors of the SASS, attempted to further specify the instrument for subjects within the sport of basketball. The situations presented to the subjects were altered to be more specific to the sport of basketball. The researcher took precautions to ensure that the meaning of the events has not been altered in any way. It was assumed that this will increase validity with respect to the sport of basketball and the attributions made (see Appendix J).
4. The degree to which standardized instructions were followed was a potential limitation. As with instruments of this nature, response set was a concern. Any perceived negative life events that may have occurred immediately prior to responding to the SASS, may have positively or negatively affected the individual's response(s). This was noted, but cannot be controlled for. The same holds true for potential intentional biases by the subjects. These out-of-sport negative and positive life events may also affect free throw performance at any point in the season.
5. Every attempt was made to control for any potential problems by implementing the use of standard consent forms (see Appendix B and C).
6. Every attempt was made to streamline the process of data distribution and collection by way of standardized, carefully explained coaches' packages. Mortality was controlled for by follow-up phone calls to ensure participation was maintained. Efforts to obtain the necessary statistics from the Alberta Colleges Athletic Conference

(ACAC) league office helped minimize the coaches' time involvement and drop-out from the study.

7. An effort was made to select subjects that were at the relative mid-point of their basketball involvement - between entry level (junior high school) and the end of their organized, competitive playing career (university and senior levels).
8. For both the practice and competitive portions of the study, a minimum number of free throws was established. A sufficient number of attempts in the practice setting helped guard against relative invalidity. Those who shot very few free throws in the competitive setting were eliminated from this portion of the study in an effort to reduce the variability of results. These parameters assisted in enhancing the validity of the results obtained.

Significance of the Study

The evolution of applied sport psychology has seen a development of interest in how athletes talk to themselves in and around training and competition. A variety of self-talk strategies and intervention programs exist. Most of these are geared toward reframing dysfunctional self-talk, then building and shaping athletes' self-talk into a performance-enhancing format in an effort to maximize performance potential (Hogg, 1995). Research into the construct of explanatory style has recently shed new light on the issue. Stemming from attribution theory (Heider, 1958; Kelley, 1967; Roberts & Pascuzzi, 1979; Weiner 1985), the theory of explanatory style states that individuals possess a certain predisposition or "style" of how they habitually attribute the reasons why both good and bad events happen to them (Seligman, 1991). This style is viewed on a continuum ranging from pessimistic to optimistic. Without an alternative and more objective format for assessing the athletes attributions, coaches are with their own subjective perceptions. With the knowledge provided by means of the SASS scores and composites, the coach can begin to understand the athlete at a deeper level with respect to the construct of concern. Handling athletes and teams after good, and not so good performances, will always be of concern to the coach. With this information, coaches can begin to systematically remove tendencies toward pessimism and work with athletes to replace it with optimism. Eliminating or even decreasing these habits of pessimistic thinking may help provide a key to motivating and ultimately improving performance in sport. By collecting the information provided by the Sport Attributional Style Scale and free throw shooting performance data, careful analysis of their interrelationships will provide the following information:

(a) it will indicate the presence/state of explanatory style within college male basketball players;

(b) it will provide support (or not) for the theory that there is a relationship between free throw shooting performance and individuals' levels of optimism/pessimism - those who are more optimistic tend to perform better than those who are more pessimistic - in the skill of free throw shooting, in the sport of basketball, in the practice and competitive environments respectively;

(c) it will provide support (or not) for findings in the literature that indicate which explanatory variables emerge as significant in accounting for variance in free throw performance in the sport of basketball.

Potential findings in all or some of the above will be of value in fostering further research into the area. This study is an intermediate stage in the process of providing coaches and sport psychologists with valuable information, and perhaps another tool to assist athletes in better realizing their potential. Specifically, the information provided herein may result in the enrichment of athlete-specific intervention programs. Components of these programs may include (a) systematically improving perceptions, (b) reframing dysfunctional self-talk, and (c) ultimately improving performance by way of raising levels of optimism.

If significant results emerge from this study, there will be implications for the practice of sport psychology and coaching in particular. If researchers, sport psychologists and even coaches can account for a significant change in performance as a result of the information provided by the SASS and the results of this study, it may provide them with further construct validity for future studies in this area.

Chapter 2

REVIEW OF LITERATURE

Attribution Theory

Attribution theory states that it is the explicit intent of all individuals to explain their own performances via their perceived causes (Heider, 1958). Heider's original work in 1944 revolved around the concept of causal ascription and the notion that attributions, and the person indulging those attributions, are influenced by each other. Heider (1958) identified personal or internal factors (ability, effort and fatigue) and environmental or external factors (task difficulty, opportunity and luck) and, within these dimensions, attempted to explain human thought processes, and how people try to make sense out of their everyday lives. As a result, he identified concepts such as judgments about intentions, causal responsibility and motive.

Rotter (1971) further developed Heider's internal and external notion and established the principle of "locus of control". Individuals were found to attribute causes of events to be either their own doing, or someone or thing outside them.

Jones and Davis (1965) adapted Heider's work and introduced the principle of "non-common" effect. This concept held that the intention behind a voluntary act is most evident when it has a fewer number of consequences that are unique (or non-common) to that event. This approach proved to be limited in nature as it did not address self-attributions, and did not consider environmental forces.

Kelley (1973) introduced the concept of co-variation. His basic premise was that the perceived cause of an event would be seen to be that factor which was present when the event was present, and absent when the event was absent. Kelley focused on three factors - consensus, consistency and distinctiveness.

In 1972, Bernard Weiner developed a model for achievement behaviour that was grounded in attribution theory. He cited four causal elements that were specific to all achievement tasks. These were ability, effort, task difficulty and luck. These elements were grouped into a two dimensional scale - locus of control and stability.

Figure 1
Weiner's Two Dimensional Model of Attribution Theory

	Stability	
Locus of Control	Stable	Unstable
Internal	*Ability*	*Effort*
External	*Task Difficulty*	*Luck*

Weiner's model became the basis for what became known as the "cognitive model" of attributional theory (Brawley & Roberts, 1984). According to the tenets of this model, subjects process information about outcomes according to whether they perceive the cause to be within them (internal) or out in the environment (external), and whether the cause is perceived as being stable (unchanging) or unstable (temporary) over the course of time (Brawley & Roberts, 1984). The person is viewed as an information processor trying to obtain cognitive mastery and a rational view of the world (Brawley & Roberts, 1984).

For several years in attribution research, this model was the basis for studies in all facets of the field. However, in 1977 Iso-Ahola and Roberts showed that for sport settings, this model did not completely apply as effort was shown to load on the internal dimension for success experiences, and on the external dimension for experiences of failure. Roberts and Pascuzzi (1979) found that the four traditional elements of Weiner's model were found to be selected by the subjects only 45% of the time. Furthermore, Bukowski and Moore (1980) found that luck and task difficulty were found to have little importance in boys' attributions for success and failure.

Weiner then added a third dimension. Internal and external causes now fell under the heading of "locus of causality", and the dimension of "locus of controllability" was added. The model was reformulated as the attributional theory of achievement motivation and emotion.

A second attributional model emerged - it was coined the "functional model" (Tetlock & Levi, 1982). This model was also termed the "motivational model". The basic tenet of this model revolved around the perceived need for people to maintain or enhance self-esteem when concerned with achievement situations. Attributions are believed to serve psychological and social functions as motivated by learned or social needs (Tetlock & Levi, 1982). In this view, athletes would be motivated to hold a biased view of their worlds in order to satisfy basic needs of fulfillment (Brawley & Roberts, 1984).

A particular pattern was revealed in various studies (Roberts, 1982; Weary, 1980; Zuckerman, 1979) that showed individuals' tendencies toward ascribing positive event outcomes to internal factors and negative event outcomes to external factors. This became the basis for what became known as the "self-serving attributional bias".

The most notable and valid attempt to *measure* the construct was developed by Russell (Causal Dimension Scale - CDS, 1982). As a result of the volumes of research completed in sport, common sense would indicate that by understanding individuals' selection of causal attributions, researchers may reveal information about their motivational structures (Cox, 1994). As noted previously, paramount to the understanding of this theory is the individual's perception of the event, and cognitively placing it into a category of either success or failure (LeUnes and Nation, 1996).

Learned Helplessness

Parallel to attributional research was the study of the concept of learned helplessness. Rescorla and Soloman (1967) found they could teach dogs to become helpless. These dogs would make no attempt to escape a shock even though the opportunity was present. This established the basic premise of the theory that animals will tend to become helpless when they believe nothing they can do will have an effect on the situation (Seligman, 1975).

Abramson, Seligman, and Teasdale (1978) reformulated the learned helplessness model and suggested that there are three dimensions related to an individual's causal attributions. It was at this point that the two paradigms seemingly converged. It was proposed that each of the dimensions was associated with an individual's particular adaptation to an aversive event. Two of the dimensions were adopted from Weiner's model, namely locus of control and stability. A third dimension was introduced and labeled *globality* (parallel to Seligman's "pervasiveness") - when a bad event occurs to a person, does that person believe the event will affect other aspects of his life (greater globality)?, or does he believe its effects are specific to the event (greater specificity)? This three dimensional approach lead to a proposed understanding of the construct of depression. Seligman and his colleagues suggested that individuals who make internal, stable and global attributions to a negative life event or outcome are said to exhibit a predisposition toward depression (Abramson et al., 1978). This conceptual framework set the stage for the construction and development of an instrument designed to measure one's attributional style. The Attributional Style Questionnaire (ASQ) was developed by Peterson, Semmel, von Baeyer, Abramson, Metalsky, and Seligman (1982).

Explanatory Style

Explanatory style is defined by Peterson and Seligman (1984) as the habitual manner in which people explain the causes of both good and bad events. Generated from the learned helplessness research (Abramson, Seligman, and Teasdale, 1978), explanatory style is a variation of Weiner's attributional theory of achievement motivation. Peterson and Seligman (1984) led the movement away from the term "attributional style" in purely a terminology shift and towards "explanatory style" as a result of the sheer vastness of the connotations brought forth by the term attribution. The Seligman camp shifted the terminology further in coining the terms "optimism" and "pessimism" to reflect overall tendencies of explaining events (Peterson, 1991). Buchanan and Seligman (1995) explain that the reason behind this was to make the construct more accessible to both the psychological community as well as the public. They caution practitioners and researchers alike to avoid generalizing use of the terms. For the purposes of this study, the terms optimism and pessimism refer to those subjects that have distinct tendencies toward respective ends of the continuum.

The general method of measurement was a self-report instrument entitled the Attributional Style Questionnaire - ASQ (Peterson et al., 1982) and was comprised of three dimensions plus composites. Original applications were designed to be in the area of depression research. Since 1982 the ASQ has been reformulated (Peterson and Seligman,

1984) , extended (Seligman, 1991), and applied to children (CASQ; Seligman et al., 1984). The ASQ has been applied cross-situationally over many realms, not the least of which has been sport (Seligman, 1991). The validity of the ASQ's application to sport has always been in question. Applying a general instrument to a specific situation has cast doubt on the validity of such studies. As a result, levels of reliability and validity have been established as being modest at best (Tennen and Herzberger, 1986).

Application to Sport

A plethora of research exists with respect to explanatory style, attribution theory and achievement in sport. Pessimistic explanatory style (PES) is to sport what "depressive attributional style" (DAS) is to depression research in clinical psychology. The profile of the PES athlete is said to be parallel to that of the clinically depressed individual (Seligman, 1991). Although the study of attribution theory has displayed emphasis on both success and failure, the majority of the explanatory style research has predominantly dealt with the outcome of failure. Attention to how individuals handle good events has been secondary, if not ignored. This approach has stemmed from the inherent belief that an individual's style of coping with negative events can have a far more profound effect on future events than a style of coping with positive events.

Studies in the sport scenario show evidence that athletes have a tendency to subscribe and succumb to the self-serving hypothesis (Cox, 1994). In the case of perceived successful events, individuals tend to enhance their egos by attributing the success to internal causes. In the case of perceived unsuccessful events, athletes tend to protect their egos by attributing failure to external causes.

The majority of explanatory style research has been focused on how individuals handle negatively perceived events. Due to the fact that explanatory style has its roots in learned helplessness and depression research, it is suggested that how individuals (athletes) handle failures in life (sport) is of much more importance because these set-backs are potentially more damaging than a deficit in the handling of success. Although there are deficit implications surrounding the athlete handling the perceived positive event, this study will distinguish between the two, and focus on how the athletes measure in these regards. This view and trend of study has been noted throughout the literature. The significance of this study is further enhanced in that explanatory style has been proven to be changeable to a certain degree (Persons and Rao, 1985).

There is one problem with the theory of explanatory style that emerges in the literature (Weiner, 1985; Seligman, 1991). It is referred to as the "caveat of responsibility" (Seligman, 1991, p. 52). The problem is as follows. In order to resist depression, it is recommended that people externalise causes of bad events. This makes sense in reference to a person who has a "depressive attributional" or "pessimistic explanatory" style (all dimensions). But, is it right to relieve oneself of responsibility for one's own behaviour? This topic has special implications in the world of sport. Coaches are always teaching athletes to assume responsibility for their own behaviour. This responsibility establishes a basis for working/training in order to improve levels of performance. Without it, the athlete will not see improvement as being under his control, and will therefore not be motivated to change and improve (Seligman, 1991). Cox (1994) reviews the attribution literature relevant to sport and concludes that an internal, yet unstable and specific "profile" should be preferred for athletes. This athlete will take responsibility for his poor performance, but will tend to attribute it to temporary and specific causes, thereby supplying a form of motivation to work to change and improve. Further research into this notion is necessary.

Environmental Factors

A major component of this study is the environment in which the performance data is executed and collected. The basic belief is that the practice environment is very different from the competitive environment. The two environments represent the laboratory and field respectively.

Other than the obvious factors of climactic conditions of time, opponent, uncertainty, etc., several components arise in the literature that indicate these environments are distinctly different. Studies show that there is a distinction between a "private attribution" and a "public attribution." The former is seen as an attribution made as a function of personal explanation, and the latter is seen as a function of self-presentation (Schlenker, 1975; Schlenker & Miller, 1977; Weary, 1980).

Social variables have been identified as being significant when examining outcome in different environments (Brawley & Roberts, 1984). In the practice environment, individuals tend to measure their free throw shooting performance against their own standards - an internal, non-social factor. In the game situation, individuals are now part of the "team". Factors coming into play now include all the team dynamics that are involved with team sport - external, social factors. Combine the inherent pressures of the competitive setting with high ego-involvement, the stress of social visibility and public evaluation, and it is easily understood how the competitive environment carries with it a scenario that would be extremely difficult, if not impossible to duplicate in practice. Many sport psychologists have based their work in this area on data that is largely set in the laboratory setting (Cox, 1994). This study steps outside this pattern and examines "absolute" performance.

Sport Attributional Style Scale

Hanrahan, Grove, and Hattie (1989) developed the Sport Attributional Style Scale in an effort to bring the construct of explanatory style into the realm of sport in a more specific and valid fashion. The SASS was designed to measure an individual's "style" of making causal attributions to specific situations in sport. The original SASS format consisted of 16 items - eight positive and eight negative. The SASS version used in this study is the 10 item (or short) version (Hanrahan and Grove, 1990a). Half of the events are described as being *positive* events, and the other half are described as being *negative* events. Individuals were asked to imagine themselves in the particular situation and to write down one cause of the outcome presented. They were then instructed to rate on a seven point bi-polar scale, the degree to which they perceived the causes of the event in relation to each dimension (stability, globality, internality, controllability and intentionality, importance, and image clarity). It should be noted that all descriptions and discussions of the SASS from this point on will refer to the short version, except in the reliability and validity section, where discussions of the 16 item version preclude the 10 item version.

Others have investigated attributions in sport specific situations (Bukowski and Moore, 1980; Carron, 1984; Iso-Ahola, 1977; Roberts and Pascuzzi, 1979; and Yamamoto, 1983). Tenenbaum, Furst, and Weingarten (1984) developed the Wingate

Sport Achievement Responsibility Scale (WSARS). Although found to be valid, the WSARS only distinguished between internality and externality of causal attributions.

The SASS goes beyond previous attempts by incorporating all the dimensions that are recommended in attributional research. By including the five recommended dimensions, the SASS allows researchers to measure all relevant elements. Analysis of any of the dimensions, composites or indices can be easily achieved by factoring out unwanted terms.

The SASS is a multiple item questionnaire (survey format). It allows for separate, and open-ended attributions for both positive and negative events. The positive and negative items are matched for content. The directions are short and simple. Subjects are asked to "read each event carefully and *vividly imagine it happening to YOU*". "Describe what you feel would be the *single most likely cause*, write it down, and then answer the questions following...". Each item consists of one "most likely cause", and seven questions with respect to internality, stability, globality, controllability, intentionality, importance and image clarity (see Appendix E).

Reliability and Validity

Inter-item consistency and test-retest reliability were examined. Mean reliability coefficients for the scales ranged from .58 to .80 (mean of .71). Hanrahan, Grove, and Hattie (1989) note that internal consistency levels of .60 have been deemed acceptable (Weiss, Bredemeier, and Skewchuk, 1985). Inter-item reliability for the dimensional sub-scales of the Attributional Style Questionnaire (ASQ) range from .44 to .69, with a mean of .54 (Peterson, et al., 1982). Russell's Causal Dimension Scale (CDS) produced a range from .52 to .88 with a mean of .72 (McAuley and Gross, 1983). Test-retest reliability of the SASS yielded a mean reliability coefficient of .73 (range = .60 to .82).

Construct validity was evaluated by correlating scores on the dimensional subscales with measures of achievement motivation and physical self esteem (Willis Scales of Competitive Motives; Willis, 1982), and measures of physical self - esteem (Fleming and Courtney's Self Rating Scale, 1984). Overall, data collected to date suggest very clearly that the SASS is a valid and reliable indicator of explanatory style in the world of sport (Hanrahan, Grove, and Hattie, 1989).

Summary

From this review of literature, the questions pertinent to this study have been drawn, and are once again presented below:

1. How do college male basketball players score on the skill of free throw shooting?
    - in the practice environment?
    - in the competitive environment?
2. How do college male basketball players score on the Sport Attributional Style Scale?
3. How does explanatory style relate to free throw performance?
    - in the practice environment?
    - in the competitive environment?
4. Which explanatory style variables account for the most variance in free throw shooting performance?
    - in the practice environment?
    - in the competitive environment?

Replication needs to be done to support sport domain validity in both the practice and competitive scenarios. New research is necessary to specifically examine the construct in reference to overall performance as well as trial by trial, temporal performance. With all the research concerned with "depressive attributional style" or "pessimistic explanatory style", there seems to be a need for a closer look at the possibility of trends of profiles emerging in the realm of sport: Do athletes possess a specific explanatory style profile (Cox, 1994)? The validation literature is wide in scope and large in number. Inconsistencies, however, do exist. Cross-situational studies, especially into the domain of sport, provide construct validation.

Chapter 3

METHODS AND PROCEDURES

Research Design and Procedures

This study has been designed to support the theory that individuals who are more optimistic tend to perform better than those who are more pessimistic. Specifically, is there a positive relationship between explanatory style and free throw shooting performance in the sport of basketball? It has also been designed to support or refute common knowledge within the literature with respect to which attributional factors account for the most variance in sport performance. This study assumes that explanatory style exists as a relative trait amongst subjects.

This study incorporates "absolute" performance in the sport of basketball as the performance criteria. Research noted previously has traditionally utilized "subjective" performance. The review of literature has shown us that there are inherent problems with the subjectivity of "perceived" performance and correlating these with attributional dimensions traditionally measured (Spink & Roberts, 1980; Brawley, 1984). The use of absolute performance will attempt to minimize this concern and provide potentially more valuable information.

Subject Solicitation

Within this phase, a number of steps were completed. First, approval from the Ethics Committee was sought, and then acceptance from Field Services within the Education Department. At this time, active solicitation of subjects commenced. Coaches were initially contacted by phone and asked to have their teams take part in the study. The conversation was of an informal nature, with a brief explanation of the study and exactly what was being requested by the researcher. Verbal confirmation from the coaches to commit their teams to the study was requested, and written commitment came from the student athletes (participants) when they completed the consent forms. The coaches were instructed that they were to receive a package with all the necessary materials in the mail.

Sport Attribution Style Scale Data Distribution and Collection

Each coach received a package in the mail containing the following materials:

1. an introductory letter to the coach — Appendix A
2. the designated number of copies of the informed consent form — Appendix B
   - for those players 18 years of age or OVER
3. the designated number of copies of the parental/guardian consent form
   - for those players UNDER 18 years of age — Appendix C
4. instructions for the coach on administering the SASS questionnaire — Appendix D
5. the designated number of copies of the Sport Attributional Style Scale (SASS)
   - complete with instructions on the cover — Appendix E
6. instructions for the coach on shooting and collecting the free throw data — Appendix F
7. the designated number of free throw tally sheets — Appendix G
8. a self-addressed, stamped envelope for return mailing

Sport Attributional Style Scale Scoring

SASS scoring was done manually by entering the SASS values from the short form of the SASS onto a pre-formulated spreadsheet (see Appendix H). For a complete description of how the SASS is scored, please refer to Appendix I (Grove, 1989). The standard 20 scores of dimensions, composites and indices were generated and coded. Subjects were given the opportunity to respond to each question via a seven point bipolar scale. As noted in the first chapter, the positive and negative events were altered to be basketball specific (see Appendix J). From this point onwards, "event explanations" and "basketball event explanations" will be used interchangeably as being the same.

It is necessary at this point to explain the SASS scores in detail. The researcher has labeled the different levels of scores yielded by the SASS for better clarification - as a three level model. Those scores that are derived by the direct results of subjects' responses are considered to be "level 1". These scores are labeled "dimensions". There are a total of seven - locus, stability, globality, controllability, intentionality, importance and image clarity. Only locus, stability and globality are included in the composite and index scores. As a result, these three are labeled "base dimensions". The SASS scores that are aggregates of the base dimensions are considered "level 2" values. These have been labeled as "composites". There are four of these in total, and they are made up of the summation of the base dimensions only. There are two SASS scores that are considered to be "level 3" values. These have been labeled "indices" because they are made up from aggregates of the composites. These two indicators are optimism and pessimism. Each of the dimensions and composites are divided into two. The first relates to subjects' tendencies in reference to negative events, and the second relates to subjects' tendencies in reference to positive events.

Table 1 below describes the descriptions for each base dimension score, composite and index, and the corresponding value range:

Table 1
Sport Attributional Style Scale
Dimensions, Composites, Indices and Associated Acronyms

1. Degree of internality or externality for negative event explanations *LNEG*
    - level 1; base dimension; higher number = greater internality
    - five questions with a possible score of 1 to 7 for each = a range of 5-35
2. Degree of internality or externality for positive event explanations *LPOS*
    - level 1; base dimension; higher number = greater internality
    - five questions with a possible score of 1 to 7 for each = a range of 5-35
3. Degree of stability or instability for negative event explanations *SNEG*
    - level 1; base dimension; higher number = greater stability
    - five questions with a possible score of 1 to 7 for each = a range of 5-35
4. Degree of stability or instability for positive event explanations *SPOS*
    - level 1; base dimension; higher number = greater stability
    - five questions with a possible score of 1 to 7 for each = a range of 5-35
5. Degree of globality or specificity for negative event explanations *GNEG*
    - level 1; base dimension; higher number = greater globality
    - five questions with a possible score of 1 to 7 for each = a range of 5-35
6. Degree of globality or specificity for positive event explanations *GPOS*
    - level 1; base dimension; higher number = greater globality
    - five questions with a possible score of 1 to 7 for each = a range of 5-35
7. Degree of internality/stability/globality for negative event explanations *ISGNEG*
    - level 2; composite score: item 1 + item 3 + item 5
    - higher number = greater pessimism
    - composite of three items ranging from 5-35 = a range of 15-105
8. Degree of internality/stability/globality for positive event explanations *ISGPOS*
    - level 2; composite score: item 2 + item 4 + item 6
    - higher number = greater optimism
    - composite of three items ranging from 5-35 = a range of 15-105
9. Degree of externality/instability/specificity for negative event explanations *EISNEG*
    - level 2; composite score: 120 minus item 7
    - opposite to ISGNEG; higher number = greater optimism

- composite of three items ranging from 5-35 = a range of 15-105

10. Degree of externality/instability/specificity for positive event explanations *EISPOS*
    - level 2; composite score: 120 minus item 8
    - opposite to ISGPOS; higher number = greater pessimism
    - composite of three items ranging from 5-35 = a range of 15-105

11. Degree of controllability for negative event explanations *CONNEG*
    - level 1; higher number = less control
    - five questions with a possible score of 1 to 7 for each = a range of 5-35

12. Degree of controllability for positive event explanations *CONPOS*
    - level 1; higher number = less control
    - five questions with a possible score of 1 to 7 for each = a range of 5-35

13. Degree of intentionality for negative event explanations *INTNEG*
    - level 1; higher number = less intentionality
    - five questions with a possible score of 1 to 7 for each = a range of 5-35

14. Degree of intentionality for positive event explanations *INTPOS*
    - level 1; higher number = less intentionality
    - five questions with a possible score of 1 to 7 for each = a range of 5-35

15. Degree of importance for negative event explanations *IMPNEG*
    - level 1; higher number = greater importance
    - five questions with a possible score of 1 to 7 for each = a range of 5-35

16. Degree of importance for positive event explanations *IMPPOS*
    - level 1; higher number = greater importance
    - five questions with a possible score of 1 to 7 for each = a range of 5-35

17. Degree of image clarity for negative event explanations *IMANEG*
    - level 1; higher number = greater clarity
    - five questions with a possible score of 1 to 7 for each = a range of 5-35

18. Degree of image clarity for positive event explanations *IMAPOS*
    - level 1; higher number = greater clarity
    - five questions with a possible score of 1 to 7 for each = a range of 5-35

19. Level of pessimistic explanatory style *PES*
    - level 3; index score: item 7 + item 10
    - higher number = greater overall pessimism
    - index combining two composites ranging from 15-105 = range of 30-210

20. Level of optimistic explanatory style *OES*
    - level 3; index score: item 8 + item 9
    - higher number = greater overall optimism
    - index combining two composites ranging from 15-105 = range of 30-210

Free Throw Data Collection

Free throw shooting performance data for the practice setting was collected from the "tally" sheets specifically constructed for this study (see Appendix G). Free throw shooting performance data for the competitive setting was collected from the Alberta Colleges Athletic Conference (ACAC) statistician. The original score sheets from the league games were collected. These statistics were sent to the researcher at the end of the season. All statistics were coded upon receipt, co-ordinated with the appropriate SASS score for each subject, and entered onto the spreadsheet. Those subjects that did not meet the minimum criteria for attempts in the field setting (< 30) were eliminated from the portion of the study that focused on subjects that attempted more free throws. As stated previously, those athletes who shoot very few free throws over the course of the season (20 games over five months) will not have had a sufficient opportunity to allow and experience the effect proposed by the construct. Too many potentially contaminating factors may have the opportunity to affect the success and/or failure of the shooter (e.g. environment, personal factors, and situational factors). Those subjects who shoot very few free throws in games will add to the variance of the performance data collected. By eliminating these subjects, the results obtained in this particular portion of the study will show less variability and add to the validity of the study.

Population, Sample and Subjects

Subjects were selected from the population of male basketball players training and competing in the Alberta Colleges Athletic Conference (ACAC). The ACAC is a post-secondary athletic conference that has member institutions in eight Alberta cities [Calgary (2), Camrose, Edmonton (3), Grande Prairie, Lethbridge, Medicine Hat, Red Deer and Three Hills], and one in Saskatchewan (Caronport). These student athletes were believed to be a representative sample of elite male basketball players at the college ability level in Western Canada. There were 12 teams participating with approximately 12 to 15 players per team (*N* = 144 to 180). Ages ranged from 18 to 22 years. The researcher could not control for attrition on these teams. As the season progressed, players may have dropped out or were cut from the team. As well, players sometimes join teams at the midpoint of the season. Athletes who did not complete the SASS, and shoot free throws in both the practice and competitive settings over the course of the season were excluded from the study.

Variables in the Study

The independent variable consists of the scores and scales produced by the Sport Attributional Style Scale (SASS), and will be denoted "EV" (explanatory variable). The dimensions of concern in the relationship-to-performance portion of the study are the locus, stability, globality and controllability base scores, the locus/stability/globality composites, and the pessimism and optimism indices. Anderson and Deuser (in Weary, Gleicher and Marsh, eds., 1993) shed confirmatory light on the need for emphasis on the dimension of controllability. They present a unique viewpoint of attributional functionalism. Specifically, they showed impressive evidence that the dimensions of controllability and locus of control should be the elements of concern in future attributional research. As a result, the controllability dimension for both negative and positive events was utilized in this study. Correlation analyses were performed with all the values presented by the SASS to determine contributory elements, and may reveal this potential.

The dependent variable consists of each subjects' scores on the skill of free throw shooting in the sport of basketball in both the practice and competitive environments. Within the practice and competitive scenarios, the dependent variable was collected from the tally sheets from the practice environment and the official game sheets from the competitive season. Practice free throw data contained 100 consecutive attempts, and the competitive free throw data contained the respective attempts taken by each subject. These figures were converted to simple percentages before being inserted into the correlation and regression analysis programs.

Data Analysis

This part of the study was divided into four sections. Section One deals with the dependent variable - free throw shooting performance data. Section Two presents the independent variables - SASS scores. Section three is concerned with correlation analyses between the dependent and independent variables. Section four presents simple and multiple linear regression analyses of categories of the dependent variable onto elements of the independent variable.

For sections three and four, the dependent variable has been categorized into four specific groups of the sample: (a) all subjects included - free throws in the practice environment (*N* = 129), (b) all subjects included - free throws in the competitive environment (*N* = 129), (c) criterion subjects included - free throws in the practice environment (*N* = 68), and (d) criterion subjects included - free throws in the competitive environment (*N* = 68).

SECTION ONE

Dependent Variable - Free Throw Shooting Performance

The first section consists of descriptive analyses for the dependent variable - free throw shooting performance data in the practice environment, and free throw shooting performance data in the competitive environment. Paired-sample *t* tests have been performed to reveal potential significance in performance between the practice and competitive environments.

SECTION TWO

Independent Variable - Explanatory Style

The second section consists of descriptive analyses for the independent variable (SASS scores). Paired-sample *t* tests have been performed to reveal subjects' tendencies toward biases in explanatory style, between respective ends of the dimensions, composites and indices.

SECTION THREE

Correlation Analysis

The third section of the study consists of correlation analyses of the interrelationship of the dependent variables with the independent variables. The four sub-categories of the dependent variable apply to this section as well as section four. These analyses graphically reveal any relationships that may exist between the variables. Pearson product-moment correlations empirically represent these relationships. This section of the study was exploratory in nature, in an effort to contribute to the literature with respect to each dimension within the SASS, and it's postulated relationship with absolute performance. It is this section of the study that will support or refute the general theory that levels of optimism and free throw shooting performance are positively related. Statistically significant results in this section will contribute information to the existing knowledge base.

SECTION FOUR

Regression Analysis

Section four consists of several simple and multiple linear regression analyses. One objective was to predict free throw performance based upon subjects' levels of optimism. The second objective was to establish parsimony in each of the four categories of the dependent variable to account for the greatest degree of variance in the dependent variable while utilizing the fewest elements of the independent variable.

Prior to proceeding, specific decisions had to made with respect to which SASS dimensions, composites and indices were to be utilized in the regression analysis models. Based upon the literature and previous findings (summarized by Hanrahan, 1995), only specific explanatory variables have been regressed onto the performance data. As a result, specific statistical models for analysis have been created. The parameters established for analysis were created as a means of minimizing the potential problem of being concerned with too many independent variables, as well as those that are highly interrelated. Below are the descriptions of these parameters:

1. The scope of this portion of the study is focused on the construct of explanatory style, specifically: optimism and pessimism. Hence, it is the base dimensions, composites and indices that are of concern. Controllability is also of concern as it has been noted in the literature as being significantly associated with the base dimensions as well as performance. Therefore, the SASS dimensions of intentionality, importance and image clarity are not relevant, and have been omitted from this portion of the study.
2. It has been suggested by Cox (1994) that athletes' dysfunctional attributions toward negative events is far more detrimental on future performance success than athletes' dysfunctional attributions toward positive events. As a result of this conceptual point of view, the attributional dimensions of the SASS that are associated with negative event explanations are of greater concern to the study.
3. Each of the SASS base dimensions load on the respective intermediate composites, as well as the overall indicators of optimism and pessimism. As a result, they are highly interrelated with one another. As a means of avoiding multicollinearity, the base dimension and the controllability dimension have been incorporated into the regression analysis models separate from the composite scores and the overall indices of optimism and

pessimism. This parameter is specific to the second multivariate question: which SASS dimensions account for the greatest degree of variability in free throw shooting performance?

4. The statistical regression model that has been created is based upon the literature and the dimensions of the SASS that have emerged as being significant - as evidenced by the result of the correlation tables in the previous section. The correlation tables were visually scanned for the potential of suppressing variables. [1]

The regression analyses were performed within each of the four dependent variable categories being regressed on the selected SASS element(s). As a result, this section has been sub-divided into the four dependent variable categories. The strategy employed begins with the optimism index, and progresses through the composites to the base and controllability dimensions, with the systematic elimination of SASS elements leading to parsimony. This strategy is shown in Table 2 below:

Table 2
Regression Analysis Strategy

1. Optimism Index (OES: opposite value is PES)
2. Internality/Stability/Globality Composite for Negative Event Explanations
3. Internality/Stability/Globality Composite for Positive Event Explanations
4. Six Base Dimensions
    - internality for negative event explanations (LNEG)
    - internality for positive event explanations (LPOS)
    - stability for negative event explanations (SNEG)

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[1] Due to the fact that there are so many dimensions, composites and indices to contend with, periodic reminders will be provided throughout the study for the reader's benefit. It is assumed at this point that the reader has sufficient knowledge of each dimension, composite and index provided by the Sport Attributional Style Scale.

- stability for positive event explanations (SPOS)
- globality for negative event explanations (GNEG)
- globality for positive event explanations (GPOS)

5. Six Base Dimensions plus the Controllability Dimensions

- internality for negative event explanations (LNEG)
- internality for positive event explanations (LPOS)
- stability for negative event explanations (SNEG)
- stability for positive event explanations (SPOS)
- globality for negative event explanations (GNEG)
- globality for positive event explanations (GPOS)
- controllability for negative event explanations (CONNEG)
- controllability for positive event explanations (CONPOS)

6. Three Base Dimensions for Negative Event Explanations

- internality for negative event explanations (LNEG)
- stability for negative event explanations (SNEG)
- globality for negative event explanations (GNEG)

7. Three Base Dimensions plus Controllability for Negative Event Explanations

- internality for negative event explanations (LNEG)
- stability for negative event explanations (SNEG)
- globality for negative event explanations (GNEG)
- controllability for negative event explanations (CONNEG)

The objective in each of the four dependent variable categories was to determine the amount of increase in free throw performance (DV) for one unit of difference in the SASS (EV) variables of choice, while controlling for other EV variables. In order for parsimony to be reached, subsequent regression analyses were run in an effort to eliminate non-contributing factors. As a result, more than the planned seven analyses were necessary to establish parsimony. Throughout this process, the researcher carefully examined the ANOVA tables presented by the results of the regression analysis strategy as well as the figures presented by the correlation tables in Section 3. Those independent variables that were found to be weak contributors to the statistical model (low *t* scores and corresponding levels of insignificance) were removed from subsequent analyses. This process systematically produces the strongest statistical models in accounting for variance in the dependent variable category, as determined by the measures of goodness of fit - the coefficients of determination (R^2 and R^2 *adjusted*).

These sub-sections also support or refute the theory of relationship between the dependent and independent variables - as subjects become more optimistic they perform better at the skill of shooting free throws. However, it has gone a step further by attempting to account for the most amount of variance in free throw performance with the least amount of explanatory style variables - establishing parsimony. Cross referencing with previous findings is relevant and has been presented in the discussion.

Chapter 4

RESULTS

This chapter sets out to answer the questions asked by the study. It is divided into four sections. The first section deals with the dependent variable - subjects' free throw shooting performance. The second section deals with the independent variable - subjects' results on the Sport Attributional Style Scale (SASS). The third section presents results of the first of two multivariate questions - how do the dependent and independent variables relate to each other? The fourth section offers results to the second multivariate question - which independent variables account for the most amount of variability in the dependent variable? The third and fourth sections each lend support to (or refute) the notion that as subjects become more optimistic, their free throw shooting performance improves.

SECTION 1: DEPENDENT VARIABLE

Free Throw Shooting Performance

The important question here is - how do college male basketball players score on the skill of free throw shooting? This performance data is the dependent variable within the study. Two environments are of concern: (a) the laboratory or practice environment, and (b) the field or competitive environment. The two are referred to as the "practice" and "competitive" environments respectively for the remainder of the study.

The first part of Section One involved collecting performance data in the practice environment. The free throw shooting environment in the practice setting was designed so that each subject would attempt the same number of free throws within the same relative atmosphere. This performance measure was collected as the number of successful shots divided by the number total shots attempted and denoted as a percentage value. Each subject attempted 100 consecutive shots.

The second part of Section One involved collecting performance data in the competitive environment. Free throw shooting results were collected from the Alberta College Athletic Conference (ACAC) statistician. Data was gathered from the official scoresheets from each conference league game, and compiled into the number of successful shots divided by the number of attempts - denoted as a percentage. Each team played a total of 20 league games from November through February. As discussed within the methodology chapter, a minimum number of attempts was established in order to control for those subjects that do not shoot enough over the course of the season.

Each of the subject categories were then examined with respect to the environment where the free throws were attempted. Hence, four categories of the dependent variable were created: 1) all subjects - free throw shooting performance in the practice environment (N = 129), 2) all subjects - free throw shooting performance in the competitive environment (N = 129), 3) criterion subjects - free throw shooting performance in the competitive environment (N = 68), and 4) criterion subjects - free throw shooting performance in the practice environment (N = 68). Of the twelve teams that were solicited for the study, only one neglected to submit the SASS and free throw data. Six subjects from the remaining eleven teams were removed from the study because they incorrectly filled out the questionnaire.

All Subjects - Free Throw Shooting Performance in Practice

Descriptive statistics were generated for all subjects and their free throw shooting performance in the practice setting ($N = 129$). The mean was 79%, with a minimum of 54%, a maximum of 96%, and a range of 42%.

All Subjects - Free Throw Shooting Performance in Competition

Descriptive statistics were generated for all subjects and their free throw shooting performance in the competitive environment ($N = 129$). The mean for this category was 61%, with a minimum of 0%, a maximum of 100%, and a range of 100% ($N = 129$).

Criterion Subjects - Free Throw Shooting Performance in Practice

Descriptive statistics were generated for the criterion subjects and their free throw shooting performance in the practice environment ($N = 68$). The mean was 79%, with a minimum of 56%, a maximum of 94%, and a range of 38%.

Criterion Subjects - Free Throw Shooting Performance in Competition

Descriptive statistics were generated for the criterion subjects and their free throw shooting performance in the competitive environment ($N = 68$). The mean was 68%, with a minimum of 41%, a maximum of 92%, and a range of 51%. No subjects were removed from this portion of the study.

Results

Paired - sample *t* tests were performed to test if the difference between the means of the two environments were significantly different within each of the sample categories. An alpha level of .05 was used for all statistical tests in the study. When the .01 level was achieved, it has been noted as a means of drawing attention to greater levels of statistical significance.

When all subjects were included in the sample set, each attempted the designated 100 shots in practice as well as a range of attempts in competition (min = 0, max = 147; $N = 129$). When only the criterion subjects were included in the sample set, those subjects that shot more than 30 free throws in competitions (min = 30, max = 147; $N = 68$) as well as their respective 100 attempts in practice were examined. As noted previously, the criterion for selection into this portion of the study was set at 30 free throw attempts in the competitive setting. This was done to eliminate those subjects that did not play much through the course of the season, and to decrease the degree of variability of the free throw percentages recorded.

Paired - sample *t* tests were utilized to reveal potential differences between free throw shooting performance in practice and free throw shooting in competition. For the category including all subjects, the result of the *t* test was statistically significant, $t\,(128) = -9.2, p < .01$. For these subjects it can be stated that free throw performance is significantly higher in practice than it is in competition. For the category including the criterion subjects only, the result was also significant, $t\,(67) = -9.9, p < .01$. In this case as well, subjects performed better in the practice setting than they did in competition.

In summary, subjects showed greater success at shooting free throws in the practice setting than in the competitive setting, both before and after the inclusion criterion was applied.

SECTION 2: INDEPENDENT VARIABLE

Explanatory Style - All Subjects

The important question here is - how do college male basketball players score on the Sport Attributional Style Scale (SASS)? The SASS was administered to each subject as the independent variable in the study. A total of twenty dimensions, composites and indices were obtained. These values and their detailed descriptions are presented in the Table 1.

Results were sub-divided into two categories: (a) all subjects (*N* = 129), and (b) those subjects that met the minimum 30 free throw attempts in competition criteria (*N* = 68). The values for the "all subjects" group and their corresponding descriptive statistics are shown in Table 3 below:

Table 3
Sport Attributional Style Scale
Descriptive Statistics - All Subjects

Variable - (Level) - Acronym		*N*	Min	Max	Mean	S.D.
Locus of Control - Negative (1)	LNEG	129	15	35	26.9	4.1
Locus of Control - Positive (1)	LPOS	129	18	35	27.2	3.6
Stability - Negative (1)	SNEG	129	6	35	22.7	5.5
Stability - Positive (1)	SPOS	129	16	35	29.1	3.1
Globality - Negative (1)	GNEG	129	8	35	21.5	5.6
Globality - Positive (1)	GPOS	129	10	35	23.5	5.2
Controllability - Negative (1)	CONNEG	129	5	28	13.5	4.4
Controllability - Positive (1)	CONPOS	129	5	25	11.9	4.6
Intentionality - Negative (1)	INTNEG	129	6	35	24.7	6.1
Intentionality - Positive (1)	INTPOS	129	5	24	11.2	5.0
Importance - Negative (1)	IMPNEG	129	11	35	27.7	4.5
Importance - Positive (1)	IMPPOS	129	11	35	29.2	4.3
Image Clarity - Negative (1)	IMANEG	129	9	35	26.5	5.8
Image Clarity - Positive (1)	IMAPOS	129	12	35	29.5	4.6
Internality/Stability/Globality - Negative (2)	ISGNEG	129	49	95	71.1	9.7
Internality/Stability/Globality - Positive (2)	ISGPOS	129	58	99	79.8	8.6
Externality/Instability/Specificity - Negative (2)	EISNEG	129	25	71	48.9	9.7
Externality/Instability/Specificity - Positive (2)	EISPOS	129	21	62	40.2	8.6
PESSIMISM (3)	PES	129	74	140	111.3	11.2
OPTIMISM (3)	OES	129	100	166	128.7	11.2

Paired - sample *t* tests were performed between the positive and negative components of each SASS base dimension and composite, to test for statistical significance. These values can be seen in Table 4 below:

Table 4
Sport Attributional Style Scale
Paired Sample Analysis - All Subjects

Variable	*t*	*df*	*p*
Locus of Control (internality/externality)	0.69	128	.493
Stability/Instability	12.7	128	<.001
Globality/Specificity	3.8	128	<.001
Internality/Stability/Globality	8.8	128	<.001
Externality/Instability/Specificity	-8.8	128	<.001
Controllability	-3.9	128	<.001
Intentionality	-19.9	128	<.001
Importance	3.6	128	<.001
Image Clarity	5.3	128	<.001
Optimism/Pessimism	8.8	128	<.001

All *t* scores were statistically significant except for the locus of control dimension. The internality/stability/globality dimension and the externality/instability/specificity dimension reflect inverse values within the SASS. This explains why the same absolute *t* value was obtained.

In general, subjects' SASS scores within each dimension and composite are statistically significant between negative and positive events. Positive figures reflect a higher score on the positive component of the dimension and/or composite. Negative figures reflect a higher score on the negative component. Subjects were found to be more stable and global when attributing causes of positive basketball event explanations. Subjects indicated that positive basketball event explanations were more controllable as well as intentional. Subjects also placed more importance on positive basketball events. Image clarity for positive basketball events was significantly higher than that of negative basketball events. Overall, subjects were more optimistic than pessimistic with respect to basketball events, when all subjects were included in the sample.

Explanatory Style - Criterion Subjects

The second category in this portion of the study consisted of those subjects who shot 30 or more free throws in the competitive environment (*N* = 68). The SASS values for these subjects and their corresponding descriptive statistics are shown in Table 5 below:

Table 5
Sport Attributional Style Scale
Descriptive Statistics - Criterion Subjects

Variable - (Level) - Acronym		*N*	Min	Max	Mean	S.D.
Locus of Control - Negative (1)	LNEG	68	16	35	26.6	3.9
Locus of Control - Positive (1)	LPOS	68	20	35	27.2	3.4
Stability - Negative (1)	SNEG	68	6	32	22.4	5.5
Stability - Positive (1)	SPOS	68	16	35	29.3	2.9
Globality - Negative (1)	GNEG	68	8	33	21.6	5.4
Globality - Positive (1)	GPOS	68	12	32	24.1	4.1
Controllability - Negative (1)	CONNEG	68	5	28	13.6	4.7
Controllability - Positive (1)	CONPOS	68	5	21	11.8	4.1
Intentionality - Negative (1)	INTNEG	68	12	35	24.4	6.4
Intentionality - Positive (1)	INTPOS	68	5	23	11.4	5.1
Importance - Negative (1)	IMPNEG	68	11	35	27.5	4.8
Importance - Positive (1)	IMPPOS	68	11	35	29.0	4.3
Image Clarity - Negative (1)	IMANEG	68	10	35	26.8	5.7
Image Clarity - Positive (1)	IMAPOS	68	17	35	30.2	3.9
Internality/Stability/Globality - Negative (2)	ISGNEG	68	50	95	70.6	8.5
Internality/Stability/Globality - Positive (2)	ISGPOS	68	58	95	80.7	7.1
Externality/Instability/Specificity - Negative (2)	EISNEG	68	25	70	49.3	8.5
Externality/Instability/Specificity - Positive (2)	EISPOS	68	25	62	39.2	7.1
Pessimism (3)	PES	68	89	140	109.9	9.1
Optimism (3)	OES	68	100	151	130.1	9.1

Paired - sample *t* tests were performed between the positive and negative components of each SASS base dimension and composite to test for statistical significance. These values can be seen in Table 6 below:

Table 6
Sport Attributional Style Scale
Paired Sample Analysis - Criterion Subjects

Variable	*t*	df	*p*
Locus of Control (internality/externality)	1.1	67	.267
Stability/Instability	9.8	67	<.001
Globality/Specificity	4.5	67	<.001
Internality/Stability/Globality	9.1	67	<.001
Externality/Instability/Specificity	-9.1	67	<.001
Controllability	-3.1	67	<.005
Intentionality	-12.8	67	<.005
Importance	2.7	67	<.01
Image Clarity	5.0	67	<.001
Optimism/Pessimism	9.1	67	<.001

Again, all differences were statistically significant except for the locus of control dimension. As before, the internality/stability/globality dimension and the externality/instability/specificity dimension reflect inverse values within the SASS.

It can be stated that subjects' SASS scores within each dimension and composite are statistically significant between negative and positive event explanations among the criterion subjects. Again, positive figures reflect a higher score on the positive component of the dimension and/or composite. Negative figures reflect a higher score on the negative component. As within the previous sample that included all subjects, the externality/instability/specificity composite, the controllability dimension and the intentionality dimension all showed a negative relationship.

In summary, subjects' SASS scores for negative events were statistically significant from positive events - except for the locus of control dimension. Subjects showed a distinct tendency toward specific polarities of each dimension.

SECTION 3: MULTIVARIATE RESULTS

SASS Scores and Their Relation to Free Throw Performance

The first multivariate question that will be addressed is - how does explanatory style relate to free throw performance? This segment is sub-divided into two sections: the practice environment and the competitive environment. All subjects that completed the SASS are included in the practice environment group. Only those that met the performance criterion are included in the competitive environment group.

All Subjects

Pearson product-moment correlations were run to investigate the relationship between SASS scores and free throw shooting performance in both the practice and the competitive settings (Appendix L; $N = 129$). Two values of statistical significance emerged. The first was between free throws in the practice setting and free throws in the competitive setting, $r = .212$, $p < .05$. As noted previously, this was expected as the skill of free throw shooting does not change, only the environment. The second statistically significant value to emerge was between free throw shooting performance in the practice setting and the locus of control dimension for positive event explanations (LPOS). It was a positive relationship, $r = .200$, $p < .01$. As subjects' feelings of internal control over positive basketball event explanations increased, so did their free throw shooting success in the practice environment.

Criterion Subjects

A second Pearson product-moment correlation table was constructed to investigate the relationship between SASS scores and free throw shooting performance in the respective settings (see Appendix M; *N* = 68). Several values of statistical significance emerged. The first was between free throws in the practice setting and free throws in the competitive setting, $r = .502$, $p < .01$. The second value to emerge was between stability for negative event explanations (SNEG) and free throw shooting performance in the competitive setting, $r = -.281$, $p < .05$. As subjects' feelings that negative event explanations are stable decreased, free throw shooting performance in the practice setting increased. Or, as subjects believed that negative event explanations were due to stable causes, their free throw shooting performance decreased.

Several other statistically significant correlations were found within this table. The majority of these relationships were between SASS scores and free throw shooting performance in the "practice" setting. The internality/stability/globality composite dimension for negative event explanations (ISGNEG) correlated with practice free throws (FTP) in a negative manner, $r = -.270$, $p < .05$. As subjects felt that negative event explanations were more internal, stable and global, their free throw shooting performance decreased in the practice environment. Locus of control for positive event explanations (LPOS) correlated with FTP positively, $r = .281$, $p < .05$. As subjects felt more in control of positive event explanations, their free throw shooting performance increased in the practice setting. Stability for negative event explanations (SNEG) correlated with practice free throws (FTP) negatively, $r = -.300$, $p < .05$. As subjects felt negative event explanations were due to more stable causes, their free throw shooting performance decreased in the practice situation. Optimism (OES) and pessimism (PES) scores also correlated with FTP; OES positively, $r = .334$, $p < .01$, and PES negatively, $r = -.334$, $p < .01$, as these are inverse scores. Although not strong statistically, this particular result supports the theory that optimists perform better than pessimists. As subjects' level of optimism toward basketball event explanations increases, their free throw shooting performance improves. However, this result only applies to the practice scenario. The competitive environment did not reveal the same levels of statistical significance in correlations between optimism and free throw shooting performance.

SECTION 4: REGRESSION ANALYSIS

Section four deals with the question of which explanatory variables contribute the most to variability in free throw shooting performance. The goal in answering this question was to establish parsimony - identifying the fewest explanatory variables that account for the most variability in free throw shooting performance. This section was divided into two subject categories. The first category included all subjects ($N = 129$); the second category drew out those subjects that attempted 30 or more free throws in the competitive environment ($N = 68$). Each of these categories has been further subdivided into two: free throws attempted in practice, and free throws attempted in competition. The four categories are titled as follows: (a) all subjects - practice environment, (b) all subjects - competitive environment, (c) criterion subjects - practice environment, and (d) criterion subjects - competitive environment. Each of these four categories were subjected to a variety of simple and multiple linear regression analyses to answer the questions relevant to the study: As subjects become more optimistic, do they also perform better at the skill of free throw shooting in the sport of basketball?; and, which SASS dimensions, composites and indices significantly account for free throw performance variability in the respective environments? Specifically, which particular SASS dimensions, composites and indices significantly account for free throw performance variability in the practice and competitive settings? Stated another way - given the set of SASS elements presented, how well can we predict free throw shooting performance with a minimal number of predictors?

Prior to proceeding, several decisions had to made with respect to which SASS dimensions, composites and indices were to be utilized in the regression analysis strategy. The basis for these decisions are borne from the review of literature and the questions relevant to the study. This rationale is presented in detail in the methodology chapter. A review is necessary at this point:

1. The scope of this portion of the study was focused on the construct of explanatory style, and specifically: optimism and pessimism. Hence, it is the base dimensions (locus, stability and globality) composites and indices that are of concern. Controllability is also of concern as it has been noted in the literature as being significantly associated with the base dimensions as well as performance (Anderson & Deuser, 1992; Sellers & Seligman, 1993). Therefore, the SASS dimensions of intentionality, importance and image clarity are not relevant, and have been omitted from this portion of the study.
2. It has been suggested by Cox (1994) that athletes' dysfunctional attributions toward negative events can be far more detrimental on future performance success than athletes' dysfunctional attributions toward positive events. As a result of this conceptual point of view, the attributional dimensions of the SASS that are associated with negative event explanations are of greater concern to the study.

3. Each of the SASS base dimensions load on the respective intermediate composites as well as the overall indicators of optimism and pessimism. As a result, they are highly interrelated with one another. As a means of avoiding multicollinearity, the base scores (locus, stability and globality) and the controllability dimension, have been incorporated into the regression analysis models separate from the composite scores and the overall indices of optimism and pessimism.
4. The statistical regression model that has been created is based upon the literature and the dimensions of the SASS that have emerged as being statistically significant - as evidenced by the result of the correlation tables in the previous section. Visual inspection of the correlation tables has assisted in the development of the strategy.

The parameters established for analysis were created as a means of minimizing the potential problem of being concerned with too many independent variables, as well as those explanatory variables that are highly interrelated. Below is a reminder of the regression analysis strategy that was employed in each of the four categories:

1. Optimism Index (OES: inverse score = PES)
2. Internality/Stability/Globality for Negative Event Explanations
   (ISGNEG: inverse score = EISNEG)
3. Internality/Stability/Globality for Positive Event Explanations
   (ISGPOS: inverse score = EISPOS)
4. Locus of Control for Negative and Positive Event Explanations (LNEG, LPOS)
   Stability for Negative and Positive Event Explanations (SNEG, SPOS)
   Globality for Negative and Positive Event Explanations (GNEG, GPOS)
5. Six Base Dimensions, with Controllability Dimensions for Negative and Positive Event Explanations (CONNEG, CONPOS)
6. Three Base Dimensions for Negative Event Explanations (LNEG, SNEG, GNEG)

7. Three Base Dimensions for Negative Event Explanations and Controllability for Negative Event Explanations (LNEG, SNEG, GNEG & CONNEG)

Throughout the analysis of these simple and multiple linear regressions in each of the four categories, the coefficient tables were scanned for those explanatory variables that showed low *t* scores and associated levels of significance. Upon the completion of the seven regression models noted within the strategy, those explanatory variables that were visually seen as being weak contributors to the model were then cross-referenced with the correlations presented by the results of the correlation tables (see Appendix L and M) and removed from subsequent regression analyses to establish parsimony. Subsequent regression analyses were run until the least number of SASS elements remained, while maintaining or increasing the strength of the statistical model.

Within the tables presented, the reported results include the *Beta* value, the *t* score, and the associated level of significance for the constant as well as each explanatory variable. Within each respective statistical model, the reported results are the *F* score (with the associated degrees of freedom), the level of significance, the R^2 coefficient of determination, and the R^2 *adjusted* coefficient of determination, as goodness of fit measures.

Category 1: All Subjects - Practice Environment

The only significant value found in this portion of the study was when free throws in the practice setting were regressed onto free throws in the competitive setting, *F* (1,128) = 5.99, $p < .05$, $R^2 = .045$, R^2 *adjusted* = .038. The regression of the pessimism composite index onto free throws in the practice environment (FTP) approached statistical significance. However, it was found to be statistically non-significant even at the .10 level.

It can be concluded that none of the SASS scores account for variability in free throw shooting performance in the practice environment when all subjects were included.

Category 2: All Subjects - Competitive Environment

There were no statistically significant values found in this portion of the study. None of the SASS scores was shown to account for variability in free throw shooting in the competitive environment when all subjects were included.

Category 3: Criterion Subjects - Practice Environment

The seven respective regression analyses in the strategy employed were run onto free throw shooting performance in the practice environment, while excluding those subjects that did not shoot 30 or more free throws in the competitive scenario. Inverse scores are noted in parentheses. These respective values are the same as their inverse pair but in the opposite direction. For the regression analyses presented in this section, the correlation table shown in Appendix L is a relevant point of reference. This table was visually inspected prior to running the regression strategy. As noted previously, only four SASS elements were found to be correlated with free throw shooting performance in the practice setting: the optimism index, the internality/stability/globality for negative event explanations composite, the locus of control for positive event explanations base dimension, and the stability for negative event explanations base dimension. Below are the results:

1. Optimism Index (OES) and Free Throws in Practice (FTP)

Table 7
Optimism Index vs. Free Throws in Practice

Variable	B	t	significance
Constant	1.137	9.408	.000
Optimism Index	3.2E-03	2.876	.005

$F(1,67) = 8.27, p < .01, R^2 = .111, R^2\ \textit{adjusted} = .098$

The optimism index is statistically significant in accounting for variance in free throw shooting in the practice environment within the criterion group.

2. Internality/Stability/Globality for Negative Event Explanations (ISGNEG) and Free Throws in Practice (FTP)

Table 8
Internality/Stability/Globality for Negative Event Explanations
vs. Free Throws in Practice

Variable	B	t	significance
Constant	.985	11.512	.000
ISGNEG	-2.7E-03	-2.281	.026

$F(1,67) = 5.20, p < .05, R^2 = .073, R^2\ \textit{adjusted} = .059$

It can be stated that the internality/stability/globality composite index for negative event explanations is significant in statistically accounting for variability in free throw shooting performance in the practice scenario, within the criterion group.

3. Internality/Stability/Globality for Positive Event Explanations (ISGPOS) and Free Throws in Practice (FTP)

Table 9
Internality/Stability/Globality for Positive Event Explanations
vs. Free Throws in Practice

Variable	B	t	significance
Constant	.688	5.734	.000
ISGPOS	1.3E-03	.858	.394

$F(1,67) = .74, p = .394, R^2 = .011, R^2\ \textit{adjusted} = .004$

The internality/stability/globality composite index for positive event explanations is statistically non-significant when regressed onto free throw shooting performance in the practice environment, within the criterion group.

4. Six Base Dimensions and Free Throws in Practice (FTP)

Table 10
Base Dimensions for All Event Explanations
vs. Free Throws in Practice

Variable	*B*	*t*	significance
Constant	.892	6.698	.000
LNEG	-6.3E-03	-2.473	.016
LPOS	7.4E-03	2.446	.017
SNEG	-5.0E-03	-2.705	.009
SPOS	3.8E-04	.108	.914
GNEG	1.8E-03	.799	.427
GPOS	-3.0E-03	-.998	.322

$F(6,67) = 3.22, p < .01, R^2 = .240, R^2$ *adjusted* $= .166$

It can be stated that when the six base dimensions of the SASS are regressed onto free throw shooting performance in the practice setting, within the criterion group, statistical significance is found at the .01 level. However, as can be seen by the *t* scores and associated significance levels of stability for positive event explanations (SPOS), and globality for both negative and positive event explanations (GNEG & GPOS), these three explanatory variables are extremely weak. contributors. Visual inspection of the correlation table (Appendix M) supports this observation.

5. Six Base Dimensions (all events) + Controllability Dimensions and Free Throws in Practice (FTP)

Table 11

Base Dimensions for All Event Explanations and Controllability Dimensions vs. Free Throws in Practice

Variable	*B*	*t*	significance
Constant	.893	5.648	.000
LNEG	-6.7E-03	-2.547	.013
LPOS	7.8E-03	2.504	.015
SNEG	-5.2E-03	-2.560	.013
SPOS	6.4E-04	.164	.870
GNEG	1.6E-03	.683	.498
GPOS	-2.9E-03	-.954	.344
CONNEG	-1.7E-03	-.713	.479
CONPOS	1.6E-03	.538	.593

$F(8,67) = 2.43, p < .05, R^2 = .248, R^2$ *adjusted* = .146

It can stated that statistical significance is maintained when the controllability dimensions for negative and positive event explanations are added to the base dimensions in accounting for variance in free throw shooting performance in the practice setting, within the criterion group. As was seen in the previous analysis, and from the *t* scores and associated significance levels, stability for positive event explanations (SPOS) and globality for both negative and positive event explanations (GNEG & GPOS) are again extremely weak in contributing to the significance. As well, it is evident that the controllability dimensions are comparatively weak. These observations are supported by the visual inspection of the correlation table (Appendix M). The R^2 coefficient of determination increased from .240 to .248, while the R^2 *adjusted* coefficient of determination decreased from .166 to .146.

6. Base Dimensions for Negative Event Explanations and Free Throws in Practice (FTP)

Table 12
Base Dimensions for Negative Event Explanations
vs. Free Throws in Practice

Variable	*B*	*t*	significance
Constant	1.053	11.009	.000
LNEG	-5.6E-03	-2.173	.033
SNEG	-5.6E-03	-3.029	.004
GNEG	6.0E-04	.325	.747

$F\,(3,67) = 3.90, p < .05, R^2 = .154, R^2\ adjusted = .115$

Statistical significance was found when the SASS base dimensions for negative event explanations were regressed onto free throw shooting performance in the practice environment, within the criterion group. However, the *t* score and associated significance level for the globality dimension (GNEG) was found to be weak. Visual inspection the correlation table (Appendix M) supports this observation.

7. Base Dimensions for Negative Event Explanations + Controllability for Negative Event Explanations and Free Throws in Practice (FTP)

Table 13
Base Dimensions for Negative Event Explanations and Controllability Dimension
vs. Free Throws in Practice

Variable	*B*	*t*	significance
Constant	1.082	10.162	.000
LNEG	-5.9E-03	-2.242	.029
SNEG	-5.5E-03	-2.898	.005
GNEG	3.4E-04	.178	.859
CONNEG	-1.4E-03	-.632	.529

$F\,(4,67) = 2.99, p < .05, R^2 = .160, R^2\ adjusted = .106$

Statistical significance was maintained when the controllability for negative event explanations was added to the three SASS base dimensions for negative events explanations, when regressed onto free throw shooting performance in the practice setting, within the criterion group. However, the *t* score and associated level of significance for CONNEG is very weak. The R^2 coefficient of determination increased slightly, and the R^2 *adjusted* coefficient of determination decreased slightly. Again, visual inspection of the correlation table (Appendix M) supports this observation.

As was noted within the review of literature (Hanrahan, 1995), and from the weak presence indicated by the globality for negative event explanations base score, the decision was made to continue with the strategy of attempting to establish parsimony, by removing this explanatory variable from the next regression analysis.

8. Locus of Control, Stability and Controllability for Negative Event Explanations and Free Throws in Practice (FTP)

Table 14
Locus of Control, Stability and Controllability for Negative Event Explanations vs. Free Throws in Practice

Variable	*B*	*t*	significance
Constant	1.091	11.490	.000
LNEG	-6.0E-03	-2.280	.026
SNEG	-5.4E-03	-2.925	.005
CONNEG	-1.5E-03	-.693	.491

$F(3,67) = 4.04, p < .01, R^2 = .159, R^2$ *adjusted* $= .120$

As a result of removing the globality dimension (GNEG), the model's strength was enhanced. The model's statistical significance reached the .01 level, the R^2 coefficient of determination remained the same, and the R^2 *adjusted* coefficient increased from .106 to .120. Because the controllability dimension (CONNEG) significance level was shown to be weak (.491), the decision was made to remove the explanatory variable and run another multiple regression analysis.

9. Locus of Control and Stability for Negative Event Explanations and Free Throws in Practice (FTP)

Table 15
Locus of Control and Stability for Negative Event Explanations vs. Free Throws in Practice

Variable	*B*	*t*	significance
Constant	1.066	12.196	.000
LNEG	-5.7E-03	-2.203	.031
SNEG	-5.5E-03	-3.033	.003

$F(2,67) = 5.87, p < .01, R^2 = .153, R^2$ *adjusted* = .127

As a result of removing the controllability dimension for negative event explanations (CONNEG), the statistical model retained its strength. The level of significance remained at the .01 level, the R^2 coefficient of determination decreased minimally (from .159 to .153), and the R^2 *adjusted* coefficient of determination increased slightly from .120 to .127. This result is relatively consistent with the correlation table (Appendix M). Stability for negative event explanations was found to correlate with free throws in the practice setting, $r = -.300, p < .05$. However, the locus of control for negative event explanations was not found to be correlated with free throws in the practice setting, $r = -.182, p = .137$.

It can be concluded that the multiple linear regression analysis of the locus and stability base dimensions for negative event explanations is statistically significant in accounting for variance in free throw shooting performance in the practice setting, within the criterion group. In other words, 15.3% of the variance in free throw shooting in the practice scenario can be accounted for by subjects' scores in the locus and stability dimensions of the SASS. As subjects' indicate that negative event explanations are due more to internal and stable causes, their free throw shooting performance in the practice environment decreases. The contrary also applies - as subjects indicate that negative event explanations are due more to internal and stable causes, their free throw shooting performance in the practice environment increases.

As a result of the strength of the locus dimension for positive event explanations (LPOS) observed in Tables 8 and 9, the researcher chose to add this dimension a priori.

10. Locus of Control and Stability for Negative Event Explanations + Locus of Control for Positive Event Explanations and Free Throws in Practice (FTP)

Table 16
Locus of Control and Stability for Negative Event Explanations + Locus of Control for Positive Event Explanations vs. Free Throws in Practice

Variable	*B*	*t*	significance
Constant	.883	7.896	.000
LNEG	-6.3E-03	-2.551	.013
LPOS	6.9E-03	2.472	.016
SNEG	-5.0E-03	-2.847	.006

$F(3,67) = 6.26, p < .01, R^2 = .227, R^2$ *adjusted* $= .191$

This statistical model proved to be the strongest of all. The model's level of significance remained at the .01 level, the R^2 coefficient of determination increased sharply from .153 to .227, and the R^2 *adjusted* coefficient of determination increased from .127 to .191. This result is supported by the findings of the correlation section as locus of control for positive event explanations was found to be correlated at a significant level, $r = .281, p < .05$.

It can be concluded that the two locus dimensions (LNEG and LPOS) and the stability dimension for negative event explanations (SNEG) combine in accounting for the greatest degree of variance in free throw shooting in the practice environment, within the criterion group of subjects. In other words, 19.1% of the variance in free throw shooting in the practice scenario, within criterion subjects, can be accounted for by the effect of the two respective locus dimensions and the stability dimension for negative basketball event explanations. In addition to subjects' feelings of internality and stability with respect to negative event explanations, as subjects' feelings increase toward the belief that positive event explanations are due to internal causes, their free throw shooting performance in the practice scenario improves. Parsimony has been established in this category.

Category 4: Criterion Subjects - Competitive Environment

The same statistical model was employed for this section of the study. The sample of subjects remained the same as in the previous category (*N* = 68), and the dependent variable was changed to free throw shooting performance in the competitive environment (FTC). For the regression analyses presented in this section, the correlation table shown in Appendix M is a relevant point of reference. This table was visually inspected prior to running the regression strategy. As noted previously, only one SASS element was shown to correlate with free throw shooting in the competitive setting - stability for negative event explanations. Below are the results:

1. Optimism Index and Free Throws in Competition (FTC)

Table 17
Optimism Index vs. Free Throws in Competition

Variable	*B*	*t*	significance
Constant	.922	6.630	.000
Optimism Index	2.2E-03	1.744	.086

$F(1,67) = 3.042, p < .10, R^2 = .044, R^2\ \mathit{adjusted} = .030$

The optimism index proved to be statistically significant in accounting for variance in free throw shooting in the competitive environment, within the criterion group, but only at the .10 level. However, this result is not satisfactory because the accepted level for statistical significance is the .05 level.

2. Internality/Stability/Globality for Negative Event Explanations and Free Throws in Competition (FTC)

Table 18
Internality/Stability/Globality for Negative Event Explanations vs. Free Throws in Competition

Variable	*B*	*t*	significance
Constant	.822	8.482	.000
ISGNEG	-2.0E-03	-1.475	.145

$F(1,67) = 2.18, p > .05, R^2 = .032, R^2$ *adjusted* $= .017$

It can be stated that the internality/stability/globality composite index for negative event explanations is statistically non-significant in accounting for variability in free throw shooting performance in the competitive scenario, within the criterion group.

3. Internality/Stability/Globality for Positive Event Explanations and Free Throws in Competition (FTC)

Table 19
Internality/Stability/Globality for Positive Event Explanations vs. Free Throws in Competition

Variable	*B*	*t*	significance
Constant	.620	4.637	.000
ISGPOS	7.5E-04	.453	.652

$F(1,67) = .21, p > .05, R^2 = .003, R^2$ *adjusted* $= -.012$

The internality/stability/globality composite index for positive event explanations is statistically non-significant when regressed onto free throw shooting performance in the competitive environment, within the criterion group.

4. Six Base Dimensions and Free Throws in Competition (FTC)

Table 20
Base Dimensions for All Event Explanations
vs. Free Throws in Competition

Variable	*B*	*t*	significance
Constant	.768	4.753	.000
LNEG	-1.9E-03	-.606	.547
LPOS	1.9E-03	.509	.613
SNEG	-5.1E-03	-2.245	.028
SPOS	-1.2E-04	-.029	.977
GNEG	8.9E-05	.033	.974
GPOS	1.1E-03	.309	.758

$F(6,67) = 1.02, p > .05, R^2 = .091, R^2\ adjusted = .002$

It can be stated that when the six base dimensions of the SASS are regressed onto free throw shooting performance in the competitive setting, within the criterion group, statistical significance is not found. All variables except stability for negative event explanations (SNEG) displayed weak *t* scores and significance levels. Visual inspection of the correlation table supports this finding.

5. Six Base Dimensions (all events) + Controllability Dimensions and Free Throws in Competition (FTC)

Table 21
Base Dimensions for All Event Explanations + Controllability Dimensions
vs. Free Throws in Competition

Variable	*B*	*t*	significance
Constant	.597	3.202	.000
LNEG	-1.1E-03	-.361	.719
LPOS	1.8E-03	.502	.617
SNEG	-6.3E-03	-2.657	.010
SPOS	2.8E-03	.607	.546
GNEG	1.3E-03	.488	.627
GPOS	3.2E-04	.091	.928
CONNEG	4.6E-03	1.668	.101
CONPOS	2.0E-03	.574	.568

$F(8,67) = 1.30, p > .05, R^2 = .150, R^2\ adjusted = .035$

It can stated that statistical non-significance remains when the controllability dimensions for negative and positive event explanations are added to the base dimensions in accounting for variance in free throw shooting performance in the competitive setting, within the criterion group. As was seen in the previous analysis, and from the *t* scores and associated significance levels, all variables but stability for negative event explanations (SNEG) are extremely weak in contributing to the model's significance. However, the controllability dimension for negative event explanations (CONNEG) approaches statistical significance at the .10 level. This observation is supported by the results shown in the correlation table (Appendix M) as controllability for negative event explanations yielded a *r* of .181, *p* = .140.

6. Base Dimensions for Negative Event Explanations and Free Throws in Competition (FTC)

Table 22
Base Dimensions for Negative Event Explanations
vs. Free Throws in Competition

Variable	*B*	*t*	significance
Constant	.828	7.502	.000
LNEG	-1.7E-03	-.557	.579
SNEG	-5.2E-03	-2.434	.018
GNEG	5.9E-04	.279	.781

$F(3,67) = 1.98, p > .05, R^2 = .085, R^2$ *adjusted* = .042

Statistical significance was not found when the SASS base dimensions for negative event explanations were regressed onto free throw shooting performance in the competitive environment, within the criterion group. However, only the *t* score and significance level for the stability dimension for negative event explanations (SNEG) was found to be contributing toward the model's significance.

7. Base Dimensions for Negative Event Explanations + Controllability for Negative Events and Free Throws in Competition (FTC)

Table 23
Base Dimensions for Negative Event Explanations + Controllability Dimension vs. Free Throws in Competition

Variable	*B*	*t*	significance
Constant	.727	6.076	.000
LNEG	-6.1E-04	-.204	.839
SNEG	-5.8E-03	-2.736	.008
GNEG	1.5E-03	.704	.484
CONNEG	4.9E-03	1.959	.055

$F(4,67) = 2.51, p < .05, R^2 = .137, R^2$ *adjusted* $= .083$

Statistical significance was achieved when the controllability for negative event explanations was added to the three SASS base dimensions for negative events explanations when regressed onto free throw shooting performance in the competitive environment, within the criterion group. Both the R^2 coefficient of determination as well as the R^2 *adjusted* coefficient of determination increased when the controllability dimension for negative event explanations (CONNEG) was added to the model. The *t* scores and levels of significance for the locus and globality dimensions for negative event explanations (LNEG & GNEG) were extremely low. As a result, the decision was made to continue with the effort to establish parsimony and these two variables were removed for the next regression analysis.

8. Stability + Controllability for Negative Event Explanations and Free Throws in Competition (FTC)

Table 24
Stability + Controllability for Negative Event Explanations vs. Free Throws in Competition

Variable	*B*	*t*	significance
Constant	.740	14.007	.000
SNEG	-5.5E03	-2.691	.009
CONNEG	4.6E-03	1.944	.056

$F(2,67) = 4.84, p < .01, R^2 = .130, R^2$ *adjusted* $= .103$

Statistical significance was achieved at the .01 level when the stability and controllability dimensions for negative event explanations (SNEG & CONNEG) were regressed onto FTC. When the locus and globality dimensions were removed from the model, the R^2 coefficient of determination decreased from .137 to .130, and the R^2 *adjusted* coefficient of determination increased from .083 to .103.

The controllability dimension (CONNEG) showed borderline statistical significance within this model. By observing this and the corresponding low level of statistical significance shown in the correlation table, the researcher made the decision to run an additional regression analysis utilizing the stability dimension for negative event explanations only. This resulted in the R^2 coefficient of determination decreasing sharply from .130 to .079, and the R^2 *adjusted* coefficient decreasing considerably from .103 to .065. As a result, the effort to establish parsimony was halted at the previous regression analysis (Table 24).

It can be concluded that the stability and controllability dimensions for negative event explanations account for the greatest amount of variance in free throw shooting performance in the competitive environment, within the criterion group. In other words, 13.0% of the variance in free throw shooting in the competitive scenario, within criterion subjects, can be accounted for by the effect of the subjects' responses along the stability and controllability dimensions for negative event explanations. As subjects' feelings decrease toward the belief that negative event explanations are due to stable and uncontrollable causes, free throw shooting performance in the competitive environment increases. Conversely, as subjects' scores on these dimensions decrease, free throw shooting performance in the competitive setting improves. Parsimony has been established in this category.

SUMMARY

Section 1 - Free Throw Shooting Performance (DV)

Statistically significant differences were found between free throw shooting success in the practice environment and free throw shooting success in the competitive environment. Subjects were more successful at shooting free throws in the practice environment than they were in the competitive environment in both samples of subjects.

Section 2 - Explanatory Style

Statistically significant differences were found between the negative and positive components of each dimension. These results were found when all subjects were included, as well as when the data of the criterion group only was extracted.

Section 3 - Dependent and Independent Variable Relationships

The correlation table involving SASS results and free throw shooting performance, using all variables and all subjects, revealed only one statistically significant finding. The locus of control dimension for positive basketball event explanations was found to be positively correlated with free throw shooting performance in the practice environment. As scores in this dimension increased, so did free throw shooting performances in the practice environment. No significant relationships were found between SASS elements and free throw shooting performance in the competitive environment when all subjects were included.

The correlation table involving all SASS elements and the criterion group (those subjects who attempted 30 or more free throws in competitions) revealed significant positive relationships between free throw shooting performance in the practice environment and the locus of control dimension for positive basketball event explanations (at the .01 level). Subjects that felt more in control of positive basketball event explanations were more successful at shooting free throws in practice.

A statistically significant negative relationship was found between free throw shooting performance in the practice environment and the stability dimension for negative basketball event explanations (at the .05 level). Subjects that believed the causes of negative basketball event explanations to be more stable, tended to perform more poorly in the skill of free throw shooting in practice, than those subjects that tended to believe causes to be more unstable.

A statistically significant negative relationship was also found between the internality/stability/globality composite for negative basketball event explanations and free throw shooting in the practice environment (at the .05 level). Subjects that believed negative basketball event explanations were more internal, stable and global (composite score), did not perform as well in free throw shooting performance in the practice setting, as those subjects that believed negative basketball event explanations were more external, unstable and specific.

A statistically significant positive relationship was found between the optimism composite and free throw shooting performance in the practice environment (at the .01 level). Subjects that tended to be more optimistic with respect to basketball events, also tended to be more successful at shooting free throws in the practice environment. Since the optimism score is the inverse of the pessimism score, subjects that tended to be more pessimistic tended to be less successful at shooting free throws in the practice environment.

Only one SASS score was found to correlate with free throw shooting performance in the competitive setting. Stability for negative basketball event explanations was negatively correlated with free throw shooting in the competitive environment. Subjects that believed the causes of negative basketball event explanations to be more unstable than stable, tended to perform better in the skill of free throw shooting in the competitive setting.

Section 4 - Accounting for Free Throw Performance Variability

This section was divided into four categories. No significant results were found in the "all subject - practice environment" group. No significant results were found in the "all subject - competitive environment" group.

Statistically significant results emerged in the "criterion subject - practice environment" group. The optimism index was found to significantly account for variance in free throw shooting performance in this category. This result supports the theory that levels of optimism and pessimism are related to performance in this scenario.

Only the regression model between internality/stability/globality for positive basketball event explanations and free throws in the practice setting emerged as being non-significant. All other simple and multiple linear regression analyses performed in this section of the study were significant to at least the .05 level. The locus of control dimensions for both negative and positive basketball event explanations, and stability dimension for negative basketball event explanations, were found to account for the greatest amount of variability in free throw shooting performance in the practice environment. Parsimony was established.

Significant results were also found in the criterion subject - competitive environment group. However, the optimism index was found to be statistically non-significant. This result refuses to support the theory that optimism and pessimism are related to performance in this scenario.

Several of the regression models in this category were found to be statistically non-significant. It was found that the stability and controllability dimensions for negative event explanations accounted for the greatest degree of variance in free throw shooting performance in the competitive environment. Parsimony was again established.

None of the regression models yielded significance in the two "all subjects" categories. Several of the models in the "criterion groups" did prove to be statistically significant. However, the regression models in the "criterion subjects - practice environment" group produced overall greater levels of significance than the "criterion subjects - competitive environment" group. Table 22 below displays these results from a graphical point of view (included are the statistical models that were "added" as part of the parsimony strategy):

Table 25

Overall Regression Model Results - Criterion Groups

Model	*DV*	*F*	*df*	*sig.*	R^2	R^2 *adj*
PES (inverse = OES)	FTP	8.27	1,67	$p < .01$	.111	.098
ISGNEG (inverse = EISNEG)	FTP	5.20	1,67	$p < .05$	.073	.059
ISGPOS (inverse = EISPOS)	FTP	.74	1,67	$p > .05$	.011	-.004
LNEG,LPOS,SNEG,	FTP	3.22	6,67	$p < .01$	.240	.166
LNEG,LPOS,SNEG,SPOS,	FTP	2.43	8,67	$p < .05$	.248	.146
LNEG,SNEG,GNEG	FTP	3.90	3,67	$p < .05$	.154	.115
LNEG,SNEG,GNEG,CONNEG	FTP	2.99	4,67	$p < .05$	.160	.106
LNEG,SNEG,CONNEG (added)	FTP	4.04	3,67	$p < .01$	.159	.120
LNEG,SNEG (added)	FTP	5.87	2,67	$p < .01$	.153	.127
LNEG,LPOS,SNEG (added)	*FTP*	*6.26*	*3,67*	$p < .01$	*.227*	*.191*
PES (inverse = OES)	FTC	3.04	1,67	$p > .05$	.044	.030
ISGNEG (inverse = EISNEG)	FTC	2.18	1,67	$p > .05$	.032	.017
ISGPOS (inverse = EISPOS)	FTC	.21	1,67	$p > .05$	.003	-.012
LNEG,LPOS,SNEG,	FTC	1.02	6,67	$p > .05$	.091	.002
LNEG,LPOS,SNEG,SPOS,	FTC	1.30	8,67	$p > .05$	.150	.035
LNEG,SNEG,GNEG	FTC	1.98	3,67	$p > .05$	.085	.042
LNEG,SNEG,GNEG,CONNEG	FTC	2.51	4,67	$p < .05$	.137	.083
SNEG,CONNEG (added)	*FTC*	*4.84*	*2,67*	$p < .01$	*.130*	*.103*

Upon visual inspection of this table, it can be seen that the strategy to establish parsimony was successful. The coefficients of determination, or goodness of fit indicators, were both maximized. Only the stability dimension for negative basketball event explanations was a common contributor to free throw shooting performance in both the practice and the competitive environments, when the criterion subjects were analyzed. This was also the only SASS element to yield statistical significance in the correlation analysis.

Chapter 5

DISCUSSION

This chapter discusses the findings of the study as they relate to the questions raised. It is divided into the same four sections as presented in previous chapters. In the first section the results of the findings with respect to the dependent variable questions are discussed. The second section discusses the results of the independent variable questions. The third section interprets and discusses the findings of the correlation analysis. Specifically, how does explanatory style relate to free throw shooting performance in each of the two environments? The fourth section discusses the results of the regression analysis and the statistical models generated.

This chapter also interprets the findings of the study in light of the existing research in the area, and how the results relate to the theoretical foundation presented in the literary review. It also examines the practical and theoretical implications of the findings, and ultimately what has been contributed by the study.

DEPENDENT VARIABLE

Free Throw Shooting Performance

The results of this section of the study clearly show that when subjects move from the practice environment to the competitive environment, free throw shooting performance decreases significantly. When all subjects were included, and when only the criterion subjects were included, the results of the paired-sample *t* tests were statistically significant to the .01 level.

An important parameter of the study was the decision to exclude subjects that attempted less free throws in the game environment. Abranovic (1997) states that when the range of a sample set is too varied, the results may become contaminated. The dilemma here involved the actual number of attempts to select in order to minimize this potential for variance error. If a high number of attempts was selected, then the sample size would drop significantly, and would also jeopardize the validity of the results. If a low number of attempts was selected, then the potential for variance error would climb. As a result of this knowledge, the researcher selected 30 attempts as the cut-off. With 20 games played in a season, 30 attempts would mean that each subject included would attempt an "average" of 1.5 free throws per game. Generally speaking, when basketball players go to the free throw line in a game, they may shoot two shots or one depending upon the situation at hand (on rare occasions a player may shoot three shots - if they are fouled while shooting a three point shot). Although this decision was not entirely a scientific one, the selection is well-grounded. This decision resulted in the exclusion of 61 of the original 129 subjects - 68 subjects remained (if the criterion cut-off was established at a minimum of 35 attempts, only 46 subjects would remain). These subjects were labeled the criterion group.

As mentioned in Chapter One, the two environments are distinctly different. In the practice setting, the climate is simulated by the coach. Many coaches choose to have the players become extremely tired in a drill, and then immediately send them to practice free throws, two attempts at a time, in order to best simulate the game environment. Other coaches choose to add negative consequences to missed free throws to simulate the negative consequences attached to the potential of losing a game. They make the consequence a "punishment" (e.g. running lines) in order to simulate game-like situations and supplant "pressure" onto athletes in the hopes that they will become better at shooting free throws in this scenario. Coaches believe that as athletes improve, they subsequently transfer this "mental toughness" to the competitive setting. However, there are no fans, there is no opponent, the clock is not running, and there is no level of uncertainty and/or perceived pressure that accompanies an actual game. As well, the coach has no objective manner of interpreting whether athletes subjectively place importance on the outcome in the practice scenario.

In essence, there is far less perceived "pressure" in the practice setting than in the competitive setting, perhaps regardless of the efforts of the coach. Intuitively, this makes sense. When subjects are moved from the practice to the game, the factors that affect performance change. For coaches, the question might be how do they better simulate the game environment within the practice environment? Or, are there other factors that may exist that will assist the coach in determining whether or not athletes have a tendency or predisposition towards success at the free throw line in the competitive arena. A basic assumption of this study is that explanatory style is one subset of cognitive pressures that may affect performance. If a coach or sport psychology practitioner can account for variance in free throw performance by measuring explanatory style, then with systematic intervention, these professionals can have an effect on performance in both environments, and perhaps in concert with simulation efforts created in the practice scenario.

INDEPENDENT VARIABLE

Explanatory Style

The SASS is a validated and reliable instrument that indicates a subject's explanatory style along 20 different dimensions, composites and indices. The results indicate a subject's level of optimism and pessimism along these scales. The researcher attempted to increase the validity of the SASS results by altering the events presented to the subjects. While ensuring the events did not change in meaning, basketball-specific events were substituted for the general sport events. It is not known whether this action increased or decreased the validity. It can only be assumed that if it did have an effect, it was the former.

The researcher made every attempt to standardize the process of data collection of the SASS. Instructions were included for the subjects as well as for the coach. Although this may have been a limitation to the study, there is no way of determining whether subjects completed the SASS correctly, honestly, sincerely, and/or absent of response set. This could not be controlled for and must be assumed to be relatively reliable and valid for the purposes of the study.

This section is divided into two sub-sections. The first discusses subjects' results on the Sport Attributional Style Scale (SASS) when all subjects were included ($N = 129$). The second sub-section discusses the SASS results when all subjects that attempted less than 30 free throws in competitions were excluded ($N = 68$). Both of these sections of the study are exploratory in nature. The question being asked is how do subjects score on the SASS. Paired-sample t tests were performed between the positive and negative components of each SASS dimension, composite and index in an effort to determine whether or not the subjects were predisposed in any way toward one end of the component. To the best knowledge of the researcher, no previous studies have been identified that mirror the question being asked. Historically, studies that examine explanatory style specifically incorporate other variables and their relationships.

All Subjects

Results in this portion of the study showed overall that subjects were more optimistic than pessimistic. Subjects (*N* = 129) showed a distinct tendency toward specific dimensions of the SASS.

With respect to the base dimensions of the SASS, subjects were overall more stable and global in attributing causes of positive basketball events. They indicated that positive basketball events were more controllable and intentional. They placed more importance on positive basketball events, and found they were more adept at imagining these positive basketball events than they were the negative basketball events. These results are congruous with research into the self-serving hypothesis (summarized by Cox, 1994). Subjects have been shown to make attributions that will be ego-enhancing in nature. The results are also intuitively meaningful as it is an inherent assumption that everyone needs to have a feeling that there is stability and control in one's life (Carron, 1984).

The result of the locus of control dimension analysis was somewhat perplexing. This base dimension was the only one that subjects did not show a distinct tendency toward one end of the SASS scale. The respective means were relatively high within a range of 5 to 35. The mean of the locus of control for negative event explanations was

26.9, and 27.2 for positive event explanations. Paired-sample *t* test showed the difference to be non-significant. Previous findings specific to the self-serving hypothesis show that individuals tend to attribute success to internal causes and failure to external causes (Carron, 1984; Mark, Mutrie, Brooks & Harris, 1984; Scanlan & Passer, 1980; Spink, 1978). The design of this study, however, does not lend itself to this type of analysis as subjects have not been categorized into perceived winners or losers, and the attributions collected were for hypothetical events followed by performance (antecedent-attribution-consequence). The previous studies mentioned examined negative and positive events, followed by attributions (antecedent-attribution).

With respect to the composite scores, subjects positive event explanations were found to be more internal, stable and global. Conversely, negative event explanations were found to be less internal, stable and global. The composite approach mirrors the dimensional approach and supports the literature as previously discussed.

Criterion Subjects

This section of the study shows the same overall results as the previous portion - subjects were found to be more optimistic than pessimistic. Subjects ($N = 68$) again show distinct tendencies toward specific dimensions of the SASS.

The results of the analysis in this section are parallel to the previous. Subjects show a distinct tendency toward specific ends of the SASS scales. As well, the means of the locus of control dimension for negative and positive event explanations were found not to be significantly different from one another.

Theoretical Consequences

The results of the SASS data have shown to be congruent with intuition as well as research findings that indicate individuals will tend to make ego-enhancing ascriptions when attributing the causes of negative and positive event explanations. The design of this study did not categorize the subjects into distinct levels of optimism and pessimism within the dimensions, composites or indices. Determining differences within the respective dimensions, composites and indices may become more meaningful, especially when related to future performance.

Practical Implications

The results obtained in this section of the study serve no practical significance until they can be related and/or linked to future performance in sport. By itself, coaches and sport psychologists can only acknowledge the existence of the SASS dimensions, composites and indices in subjects. Until predictive value can be established, coaches and sport psychologists can only hypothesize that SASS scores and tendencies will have significant importance attached.

MULTIVARIATE RELATIONSHIPS

Multivariate questions within the study are two-fold. The first segment of this section of the study revolves around the question of whether or not explanatory style relates to free throw performance in each of the respective environments. The second segment deals with accounting for variance in free throw shooting performance in each of the respective environments, and specifically, which dimensions, composites and indices account for the greatest degree of variance in performance. The issue of parsimony was addressed in both the practice and competitive environments respectively.

Relationship Between Explanatory Style and Free Throw Shooting

For the purposes of discussion, this section of the chapter is divided into the two categories established previously - all subjects and criterion subjects. Pearson product-moment correlations were run between each of the SASS dimensions, composites, and indices with free throw shooting performance in both environments respectively.

All Subjects

When all subjects were included in the sample set, only two correlations were found to be statistically significant. The first was between free throws in each of the respective environments. This was expected as the two should be highly interrelated because they are the same skill, but not to the surprisingly low level of significance revealed ($r = .212$). However, two factors may be seen as leading to this result.

The first factor contributing to this result is the nature of the data. As noted previously, the number of free throw attempts in the competitive setting was not controlled. As a result, this data subset yielded very dubious and highly variable values. For example, subjects that attempted two free throws and made them both (100%) were included with subjects that attempted two free throws and made neither (0%). This high degree of variability contaminates the results and renders them virtually invalid. The subjects that were in this category were mixed in with those that made a sufficient number of attempts.

The second factor that may have contributed to this low level of significance was the environment in which the free throws were attempted. As noted previously, the practice environment is distinctly different from the competitive environment. The inherent "pressures" in the practice setting are weak, and simply simulated by the coach at best. Once the subject steps out of the relative comfort of the practice gym and into the competitive arena, the set of cognitive and behavioral factors affecting performance change and amplify considerably. The thought of missing a shot in practice is of little consequence in relation to that of a missed shot in a game, when the score is close, time is running out, and the game means the difference between the season ending prematurely and the opportunity to win a championship. This statement casts the discussion back to the problem of perception. Spink and Roberts (1980) implied that perhaps two sets of ascriptions may be possible: one for "absolute" outcome, and the other for "perceived" outcome. For the athlete in the practice setting, missing free throws may not have the same degree of consequence attached as that of the free throw in a game. As a result of the weak relationship shown between the two environments, the inference can be made that the two environments are considered to be significantly different from one another, and subsequently influence free throw shooting performance in different ways.

The only other SASS variable that related to free throw performance was the locus of control dimension for positive event explanations, $r = .200$, $p < .01$. As subjects felt positive basketball event explanations were more due to internal causes, their free throw shooting performance in the practice environment increased. The low value yielded in this case, although statistically significant at the .01 level, cannot be viewed as practically significant. It must be noted that this relationship was with free throw shooting performance in the practice scenario only. It is speculated that the reason free throws in the competitive setting did not relate to this SASS dimension (or any other) is due to the variability problem and not having a minimum number of attempts established.

Cox (1994) states that an internal locus of control with respect to positive events is preferred to an external locus. Weiner (1985) and McAuley and Gross (1983) examined the cause and effect relationships with respect to locus of control. When subjects attributed positive events to internal causes, they typically felt pride, confidence and satisfaction. If subjects attributed positive events to external causes, they felt gratitude and thankfulness. Consequently, internalizing success can be seen as a means of enhancing self-efficacy (Bandura, 1977).

From a theoretical perspective these results support the findings in previous literature. From a practical standpoint, although the level of significance is relatively low, it seems to make sense for coaches to do their best to assist athletes in developing a sense of internality with respect to attributing causes of positive events in sport. Rotter (1971) found that as children matured, they became more internal. This finding was in relation to both positive and negative events. The coach (and parent?) should be aware of this trend and endeavor to enhance this positive relationship in an effort to develop self-confidence to its fullest. The implications of internalizing negative events will be discussed later in the study.

Criterion Subjects

Several Pearson product-moment correlations were found to be statistically significant when the criterion subjects were extracted from the "all subjects" sample. When the relationship between free throw settings was examined, it was noted that the relationship strengthened considerably from $r = .212$ in the all subjects sample, to $r = .502$ ($p < .01$) in the criterion subjects sample. The reason for this relationships' strength increase is speculated to be the same as the reason why the same relationship in the "all subjects" sample was weak. In other words, because the criterion was applied, and the number of attempted free throws in the competitive setting was increased for inclusion, the variability in results decreased, and subsequently increased the validity of the results. When free throws in the respective settings were analyzed among those subjects who shoot more free throws, a stronger relationship was found. However, because the value is still relatively weak, it can again be inferred that the two environments are non-similar in the affect they have on free throw shooting performance.

Only one SASS variable was found to correlate with free throw performance in the competitive scenario when the criterion subjects were examined - stability for negative event explanations. This relationship was negative in direction, $r = -.281$, $p < .05$. Stability relates to one's expectations for future success. The result of this correlation can be understood clearly within the framework of the cognitive model of attribution theory (Gill, 1986). As subjects feel that negative events are increasingly unstable and temporary, free throw shooting performance in the practice environment improves. As with previous relationships revealed, the strength of the correlation is weak, but it is statistically significant nonetheless. No other SASS variables were found to significantly correlate with free throws in the competitive environment.

A total of four different SASS variables were found to significantly correlate with free throw performance in the practice setting when the criterion subjects were included in the sample. Two of these were SASS base dimensions. The first was locus of control for positive event explanations, $r = .281, p < .05$. As subjects feel that the causes of positive events become due more to themselves (internal factors), free throw performance in the practice scenario improves. This finding seems to fit both the cognitive and functional models of attribution theory. Subjects' tendencies in this scenario can been seen as both ego-enhancing and motivating.

The second SASS base dimension to correlate with free throw performance in the practice setting when the criterion subjects were examined was stability for negative basketball event explanations, $r = -.300, p < .05$. As subjects feel that negative events are increasingly unstable and temporary, their free throw shooting performance in the practice environment improves. This finding duplicates the correlation found between this particular SASS base dimension and free throw shooting performance in the competitive environment. This dimension was the only SASS variable that correlated with free throws in both environments.

One of the SASS composites was found to correlate with free throws in the practice setting when criterion subjects were examined - internality/stability/globality for negative event explanations, $r = -.270, p < .05$. When these three base dimensions were combined, they emerged as being significantly negatively correlated. As subjects became more internal, stable and global with respect to negative basketball event explanations, their free throw shooting performance in the practice setting decreased. This finding supports previous findings to the extent that stability for negative event explanations is included in this composite.

The most significant finding in this portion of the study was the correlation between the optimism index and free throw performance in the practice scenario. Because the optimism and pessimism indices are reversed scores of each other, only the optimism index requires discussion. This relationship was found to be the strongest of all, $r = .334$, $p < .005$. Although this is a relatively weak correlation from a statistical standpoint, it must be brought into light with respect to the implications it may have on the performance measure being examined. Basketball is a dynamic sport that utilizes complex skills within individual and team maneuvers. Often a game can come down to a last second shot and/or free throw attempt. If there is some way that coaches can gain information that will allow them to improve a player's free throw shooting performance only a few percentage points, then the likelihood of that player succeeding at the next given opportunity, even if it is minute in scope, it may be enough to make a large difference in the outcome of the game. In this perspective, perhaps a r score of .334 is more practically significant than it seems.

What has emerged as a result of this analysis are very clear answers to the question relevant to the study - which SASS variables relate to free throw shooting performance? The significant finding is that optimism is related to free throw shooting performance in the practice scenario among subjects that shoot more free throws in games. This finding supports previous studies that show that optimism and performance are related to performance in sport (Buchanan & Seligman, 1995).

What is not surprising is the absence of statistically significant relationships among the explanatory variables and free throw shooting in either environment when all subjects were included. For the same reason (criterion selection), it is also not surprising that more statistically significant relationships were found when only the criterion subjects were included. What is noteworthy, however, is that there were more statistically significant results in relation to free throws in the practice environment than there were in the competitive environment when the criterion subjects were analyzed. Although it would be desirable for this study to show that explanatory style is more directly related to performance, the findings suggest two possible interpretations. The first involves the respective environments. As noted previously, there are very different sets of factors that exist in the competitive arena. In the practice setting, subjects are under less pressure. In addition to this point, the study was set up in a situation very different from how the teams may normally shoot free throws, perhaps the usual pressures associated with the practice were even less in magnitude. This may have allowed the construct of explanatory style to exert its effect with less interference from other potential cognitive and behavioral factors. It is speculated that as subjects move from the practice to the game, the situational and social factors that are known to exist, exert their presence in such a way that explanatory style becomes so much less a factor that it loses its correlation with the performance variable.

The second possible interpretation deals with the manner with which the free throws were attempted in the practice setting. Each subject was asked to shoot 100 "consecutive" free throws. In a game or relatively normal practice setting, subjects rarely shoot more than two at a time. This environment was designed so that if any internal and/or external factors may have "normally" had a tendency to contaminate the construct's postulated effect, the opportunity for these other variables to intervene would be minimized by not allowing any breaks in the subjects' succession of free throw attempts. This speculation is intuitively appealing. However, to the best of the researcher's knowledge, there are no studies supporting this framework.

Explanatory Variables Accounting for Free Throw Shooting Variance

The final section of the study deals with the question of which explanatory variables were found to account for the greatest degree of variance in free throw shooting performance. Statistical models were constructed in order to answer the question. As a foundation for these models, several parameters were developed and set as a means of trimming down the scope of the question with respect to the overall number of variables present. The purpose was to avoid the potential for committing the error of multicollinearity - where variables that are interrelated have either a multiplicative or suppressing affect on each other. This error may skew the results of the regression model. More importantly, the model had to be grounded in the literature and required focus on the variables that the literature has noted as being significant.

The main goal within this section of the study was to establish "parsimony". In other words, the statistical model was constructed to effectively account for the greatest degree of variance in the dependent variable while factoring "out" non-contributing variables, factoring "in" the "fewest" number of contributing explanatory variables, while maintaining or magnifying statistical significance. From a theoretical viewpoint, and should this goal be achieved, future research can begin to narrow in on the explanatory factors that have the greatest impact on subsequent performance. From a practical standpoint, the coach and sport psychologist can use these results by effectively incorporating this knowledge into specific intervention programs.

One statistical model utilizing both simple linear and multiple linear regression was generated and applied to each of the four subject categories: 1) all subjects and free throw shooting performance in the practice environment, 2) all subjects and free throw shooting performance in the competitive environment, 3) criterion subjects and free throw shooting performance in the practice environment, and 4) criterion subjects and free throw shooting performance in the competitive environment.

The plan to establish parsimony followed a sound and structured format. As discussed previously, it was designed primarily as a result of the knowledge gained from the literature. Anderson and Deuser (1993) provide a detailed summary of the factors that have traditionally been associated with explanatory style and performance. These include the standard dimensions of locus, stability and globality. As well, they argue that controllability is the dimension that has been overlooked in previous research, yet it is the most important. Through their functionalist perspective, Anderson and Deuser (1993) make two strong predictions. The first is that people tend to think about causes in terms of controllability and locus. The second is that in an unconstrained environment, controllability and locus contribute most importantly to all attributional effects. In studies by Anderson (1991) and Sellers and Peterson (1993), it was shown that controllability and locus attributions were selected significantly more than other dimensional factors of stability and globality. In addition to this conceptual foundation, other criteria included the belief that it is the negative event explanations that have a greater affect on subsequent performance than the positive components. From these assumptions, the statistical models were constructed. As a reminder to the reader, below is the statistical strategy employed:

1. Optimism Index (OES: inverse score = PES)
2. Internality/Stability/Globality for Negative Event Explanations
   (ISGNEG: inverse score = EISNEG)
3. Internality/Stability/Globality for Positive Event Explanations
   (ISGPOS: inverse score = EISPOS)
4. Locus of Control for Negative and Positive Event Explanations (LNEG, LPOS)
   Stability for Negative and Positive Event Explanations (SNEG, SPOS)
   Globality for Negative and Positive Event Explanations (GNEG, GPOS)
5. Six Base Dimensions in 4, with Controllability Dimensions for Negative and Positive Event Explanations (CONNEG, CONPOS)
6. Three Base Dimensions for Negative Event Explanations (LNEG, SNEG, GNEG)
7. Three Base Dimensions for Negative Event Explanations and Controllability for Negative Event Explanations (CONNEG)

All Subjects - Free Throw Shooting Performance in Practice

Of the seven regression analyses run between explanatory variables and free throws in the practice setting (FTP), none of the results yielded statistical significance. The regression of the optimism index onto FTP was close to statistical significance, narrowly missing the .05 cut-off. This result was expected due to the criterion issue and the invalid results generated by the sample set. It is speculated that the variability of the free throw shooting data is not conducive to yielding significant results.

All Subjects - Free Throw Shooting Performance in Competition

As in the previous section, and for the same reasons noted, none of the regression analyses models in this subject category yielded significant results.

Criterion Subjects - Free Throw Shooting Performance in Practice

Of the seven regression analyses performed, only one emerged as being statistically non-significant - the internality/stability/globality composite for negative event explanations. The remaining regression models contributed to accounting for variance in free throw performance in the practice scenario. The direction of the relationships, were carefully scrutinized along with the strength of the *t* scores and corresponding levels of significance, as well as the coefficients of determination - R^2 and R^2 *adjusted*. These coefficient values represent the percentage of variance accounted for by the explanatory variable. For example, the optimism index yielded a positive relationship and a R^2 of .111. This means that the optimism index accounts for 11.1% of the variance in free throw shooting performance in the practice environment when the criterion subjects were selected. This is considered a rather weak relationship. There is one problem with the R^2 coefficient. When variables are added, R^2 tends to inflate falsely. The R^2 *adjusted* coefficient resists this tendency. As a result, establishing parsimony will involve an attempt to decrease the number of explanatory variables used while maintaining, if not strengthening, these two coefficients of determination (Abranovic, 1997).

The two SASS composites in relation to negative and positive event explanations were examined independently. The negatively grounded composite showed a negative relationship at the .05 level, but the R^2 indicated an accounted variance of only 7.3%, and the R^2 *adjusted* indicated an accounted variance of only 5.9%. The positively grounded composite was shown to be statistically non-significant. However, when these composites were separated into their six base dimensions, statistical significance increased sharply. The relationship was positive with R^2 indicating an accounted variance of 24.0% and R^2 *adjusted* indicating an accounted variance of 16.6%. Again, as these figures reflect empirical significance, it remains difficult to claim conceptual and/or practical significance due to the low coefficients of determination. Within this result, it was observed that three of the six explanatory variables yielded very weak *t* scores and levels of significance. Stability for positive event explanations and both global base dimensions were viewed as non-contributors within this model. Both locus base dimensions and stability for negative event explanations produced strong *t* scores and levels of significance at the .05 level. This result supports the previous finding that stability and locus are related to performance in this setting, and it is supported by the literature (Anderson & Deuser, 1993).

As the parsimony plan progressed, the controllability base dimensions were inserted into the model. Statistical significance remained. As anticipated, the R^2 coefficient increased with the addition of two variables (from .240 to .248). However, the R^2 *adjusted* coefficient decreased from .166 to .146. The previously strong contributors of locus of control for negative and positive event explanations, and stability for negative event explanations remained strong to the .05 level. The two globality base dimensions and the stability for positive event explanations remained to be non-contributors. However, the *t* scores and levels of significance for the controllability base dimensions were markedly weak. The literature states that these dimensions should contribute to the model's significance (Anderson & Deuser, 1991). This result refutes this claim.

The next model included only the three base dimensions for negative event explanations (locus, stability and globality). Statistical significance was retained at the .05 level. The R^2 coefficient dropped slightly to .154, and R^2 *adjusted* dropped to .115. The locus and stability dimensions contributed strong *t* scores and levels of significance to the .05 level. Globality for negative event explanations was viewed as being a non-contributor with a *t* score of .325 and level of significance of .747. This result is consistent with the findings to this point. When the controllability base dimension for negative event explanations was added in the next model, statistical significance was retained. However, the globality and controllability dimensions were again non-contributors. This signified the end of the regression analysis plan for establishing parsimony based upon the literature.

From this point, the researcher made the decision, based upon the trend within the findings, and visual inspection of the relevant correlation table, to proceed with additional models that omitted non-contributors. First, the globality base dimension was removed. Statistical significance was retained, and the coefficients of determination remained virtually unchanged. Controllability remained a non-contributor and was removed. Statistical significance achieved the .01 level, R^2 dropped slightly from .159 to .153, and R^2 *adjusted* increased slightly from .120 to .127. At this point only two explanatory variables remained - locus of control and stability for negative event explanations. The variables removed from the model, and the variables selected to be retained, were consistent with the findings presented by the relevant correlation table in the previous section.

The researcher then chose to re-introduce an explanatory variable that showed to be a contributor to the model's significance earlier in the strategy. Locus of control for positive event explanations had previously shown to be a strong contributor with a high *t* score and level of significance at the .05 level, and as a result was introduced back into the model. This dimension was shown to be correlated significantly in the correlation table in the previous section. This decision caused the significance of the model to grow considerably. The level of significance of the model remained at the .01 level, the R^2 coefficient increased sharply from .153 to .227 and R^2 *adjusted* also rose considerably from .127 to .191. As anticipated, the direction of the relationships to free throw shooting performance in the practice setting were negative for the negative components and positive for the positive component. The *t* scores were high, and the levels of significance remained strong ($p < .02$). The goal of parsimony was established - locus of control for both negative and positive event explanations, and stability for negative event explanations accounted for the greatest amount of variance in free throw shooting performance in the practice environment. As subjects' feelings of overall internality and stability toward negative event explanations increase, free throw shooting performance in the practice environment decrease. In other words, coaches and sport psychologists can predict that subjects who believe that negative events are due to "external" and "unstable" causes, and that positive events are due to internal causes, will tend to display better free throw shooting performance in the practice setting. However, the strength of this prediction, in a practical sense, is in question due to the relatively low values achieved.

Although statistical significance is present, conceptually, the model only shows weak predictability of free throw shooting performance in the practice setting and not the competitive scenario (to be discussed in the next section of the study). As well, observers can only predict this performance measure approximately 22% of the time. Should this be of significance to the coach or the sport psychologist? As presented earlier, if a coach can account for variance in performance to this extent, it may only need to translate into success on relatively few occasions. In a 20 game season, a relatively small number of games may be won or lost by a small number of points. In a game that has a 30 point differential, not enough free throws are attempted to have an influence on its outcome. Some games are won and lost at the free throw line with the score very close, and little time left on the clock. However, all conditions leading to the opportunity must be present at the same time. For example - can the coach influence which player is on the line?; how much time is left?; is the score close?; and which of the coach's players have an SASS profile that indicates very high tendencies in the dimensions that have been shown to be of significance? The situational and social factors mentioned earlier will all come into play. They tend to push explanatory style out of the equation as seen in the correlation analysis in the previous section of the study.

Criterion Subjects - Free Throw Shooting Performance in Competition

From a conceptual standpoint, it is this section of the study that, if significant results are achieved, will have the most practical impact on this area of research and transference to practice within the sport of basketball. The same regression models were applied to this subject category. However, an overall drop in statistical significance was observed. The optimism index was statistically significant, but only at the .10 level, and yielded very low coefficients (4.4% and 3.0% respectively). Neither of the composites showed statistical significance. Throughout these results, only one dimension seemed to be a contributor - stability for negative event explanations consistently showed a strong *t* score and significance level (.05 level). Statistical significance was not achieved until the controllability base dimension for negative event explanations was added to the three negatively grounded base dimensions. .This was the last regression model in the strategy. As a result of the emerging *t* scores and levels of significance, it was determined that locus and globality should be removed because they were obvious non-contributors.

An additional model was constructed that included stability and controllability for negative event explanations. This model gained significance (from the .05 level to the .01 level). However, R^2 dropped slightly from .137 to .130, and R^2 *adjusted* increased slightly from .083 to .103.

The goal of parsimony was established - stability and controllability for negative event explanations accounted for the greatest amount of variance in free throw shooting performance in the competitive environment, when criterion subjects were analyzed. As subjects' feelings of stability toward negative event explanations increases, and feelings of controllability toward negative events decreases, free throw shooting performance in the competitive environment declines. In other words, it is possible to predict that subjects who believe that negative events are due to "unstable" yet "controllable" causes, will tend to display better free throw shooting performance in the competitive environment. However, the strength of this prediction is also in question due to the relatively low values achieved.

The results achieved in this section of the study are supported by previous literature in that controllability is seen as a primary factor in subjects' attributions and performance (Anderson & Deuser, 1993; Cox, 1994; Hanrahan, 1995; Sellers & Peterson, 1993). However, locus has been replaced by stability in this scenario. This supports previous research by Sellers and Peterson (1993) that controllability and locus are omnipresent in subjects' attributions and their relation to performance.

As noted in the previous section, statistical significance is present. The model suggests it is possible to predict free throw shooting performance in the competitive setting. However, this performance measure can only be predicted approximately 10% to 13% of the time. Should this be of significance to the coach? As presented earlier, if a coach can account for variance in performance to this extent, it may translate into success because many games are won and lost at the free throw line with the score very close, and with little time left on the clock. Again, all conditions leading to the opportunity must be present at the same time. The odds of this occurring are remote at best. Which of the coach's players have an SASS profile that indicates very high tendencies in the dimensions that have emerged to be of significance? Other situational, social, cognitive and/or behavioral factors mentioned earlier may have come into play, and may have pushed explanatory style out of the equation. What is noteworthy in the two respective environments is that only one explanatory variable is shown to be a contributor in both the practice and competitive environment - stability toward negative event explanations. It is this same SASS dimension that was the only element shown to correlate with free throw performance in the previous section. For the coach concerned about practice performance, locus of control is an additional factor. For the coach concerned more about the competitive environment, it is controllability that becomes the additional factor.

SUMMARY

Dependent Variable - Free throw Shooting Performance

This study has revealed results that intuitively match the notion of the difference between the practice environment and the competitive environment. There are sets of factors that are individual, situational and social that influence the respective environments in varying combinations.

Independent Variable - Explanatory Style

This study has shown that subjects within the sample reflect distinct tendencies toward different ends of the dimensions, composites and indices. These "profiles" are significantly more optimistic than pessimistic.

Relationship Between Explanatory Style and Free Throw Shooting Performance

This study has shown that particular explanatory variables are related to free throw performance in the respective environments. However, these relationships did not appear until the subjects that play less and shoot less free throws in games were removed. Overall, the question of whether or not subjects that tend to be more optimistic will also tend to be more successful at shooting free throws was supported statistically in one environment only - practice. The relationship was a relatively weak one, and cannot strongly support conceptual significance or be of practical importance.

Explanatory Variables Accounting for Free Throw Shooting Variance

This section of the study shows that particular explanatory variables account more than others for free throw shooting variance in each of the respective environments. Parsimony is established in both the practice and competitive environments. The most noteworthy finding in this section is that explanatory style shows to have more effect on free throw shooting performance in the practice setting than it does in the competitive setting. The rationale for this revolves around the difference between the factors affecting the two environments. The practice setting is situational in nature and involves more of a personal and private evaluation. The competitive scenario involves public visibility not present in practice, and situational factors that seemingly cannot be reproduced in the practice situation (Brawley, 1984). Ultimately, this study cannot draw sufficient levels of practical inference due to the relatively low levels of significance achieved. There are simply too many factors that seem to influence performance in this scenario.

An assumption within this study is that the explanatory variables shown to correlate with free throw shooting performance will be the same as those shown to be significant in the regression model. The regression model with respect to the practice environment supports the same variables that the correlation analysis does. Only one anomaly emerges - locus of control for positive event explanations does not show to be significantly related in the correlation analysis, but emerges as significant in the regression model. The researcher cannot explain this.

The regression model with respect to the competitive environment only supports the findings in the correlation analysis with one explanatory variable being common - stability for negative event explanations. The correlation analysis does not show other explanatory variables as being significant. The regression analysis shows that controllability for negative event explanations is significant in contributing to the predictability of free throw variance in the competitive setting.

Between the two environments, the locus, stability and controllability dimensions have been shown to be prominent. This is supported by the work of Gill, Ruder, and Gross (1982).

Chapter 6

SUMMARY, CONCLUSIONS and RECOMMENDATIONS

The intent of this study was to shed light on the construct of explanatory style and relate it to free throw shooting performance in the sport of basketball. This final section provides a summary of the study by presenting conclusions of the findings surrounding each of the questions raised and making recommendations for future research directions.

Theoretical Framework

The research questions being asked in this study emerged from the review of literature and the apparent void in the area of absolute performance, explanatory style, and their interrelationship. The questions asked by the study reflect the attribution-consequence perspective noted by Brawley (1984). Of intuitive appeal was the question of interrelationship between free throw shooting performance and the overall measure of explanatory style - optimism/pessimism. Significant findings in this realm would be considered desirable as they would be discreet and easily packaged for practical use. However, perhaps due to the fact that this measure is a third generation scale (aggregate), practically significant findings were difficult to establish. It has been shown by Seligman (1991) that optimism only reveals an individual's "resilience" to perceived poor performance, and has minimal predictive power with respect to future performance.

The more specific question asked by the study was generated from the volumes of research suggesting which explanatory style elements are more pertinent to the individual, and which of these elements are selected more often by subjects in attribution situations.

Hanrahan (1995) and Anderson & Deuser (1993) independently reviewed the state of research in the area to date and suggest which of these explanatory style dimensions are more relevant to future research. This study partially supports these suggestions.

How Do College Male Basketball Players Score on Free Throw Shooting?

It can be concluded from the results of this study that the sample of subjects perform better at the skill of free throw shooting in the practice environment than they do in the competitive environment. This result was statistically significant when all subjects were examined as well as when only the criterion subjects were examined. This supports the findings and suggestions of Brawley (1984) that there are situational and social factors in the competitive setting that are not as clearly evident in the practice setting, either categorically and/or in magnitude. This also confirms common belief in the sport of basketball that the "pressures" in competition are seen as different from those in practice.

The concept of absolute versus perceived performance remains. Although the free throw in basketball can be considered to have a relatively absolute outcome attached, it is not confirmed by any known research as being 100% absolute. In other words, it may still be possible for a subject to perceive a missed shot as a positive, negative or non-negative performance. This dilemma requires further research to isolate subjects' subjectivity.

The research question asked in this section of the study was necessary in preparation for the questions to follow. A basis for the distinction between the two respective environments required grounding. The free throw in basketball has been used by countless researchers because of its ease of measurement, administration and minimal time and equipment required.

Recommendations

Although the results of this section confirm intuition, further research is needed to examine more closely the respective environments within which the sport of basketball is engaged. Studies are necessary that will take a more detailed approach to the specific situational and social factors that are evident in the practice as well as the game, and perhaps identify any other factors that may exist. Information provided by this direction may assist the coach and sport psychologist in obtaining additional information about the athlete. An additional recommendation is to engage in research that looks at the team component by relating team performance to a variety of psychological constructs. Ultimately what qualifies the use of this skill in research is the question relevant to the study.

How Do College Male Basketball Players Score on the Sport Attributional Style Scale?

It can be concluded from the results of this study that the sample of subjects are more optimistic than pessimistic in the general sense. Specifically, subjects were found to indicate that positive event explanations were more stable and global, and that negative event explanations were more unstable and specific. Subjects were found to indicate they were in less control of negative events and more in control of positive events. They indicated that positive events were more intentional and negative events were less intentional. Subjects placed greater importance on positive events and less importance on negative events. Subjects also found they could imagine positive events with greater image clarity than negative events. Only one element of the SASS did not show subjects displaying a distinct tendency toward one end of the scale - locus of control. All results in both subjects categories were statistically significant to the .001 level.

Recommendations

Examining the construct of explanatory style within the individual requires more thorough inspection. However, without the results of group or team research, transference to the individual is difficult to make.

The use of information provided by the SASS in the group setting seems only relevant when the nature of the group is evident. Inferences about a group and/or an individual's "style" are rooted in the demographics of the group being examined. Research directions into the construct of explanatory style may look at homogenous samples of subjects to gain better understanding of that sample's "profile". Results in this direction may provide interesting information about group tendencies.

Of more practical significance would be research into the application of the knowledge provided by the SASS. Limited research has taken place in this respect. Rotella (1978) and Seligman (1991) provide samples of forms of cognitive restructuring. These and other potential examples are necessary to bring the construct of explanatory style into application in the world of sport.

For the purpose of this study and the questions asked, the SASS elements of intentionality, importance and image clarity were not examined. The SASS is the most comprehensive measure of attributions as it includes all components believed to be relevant in attribution research (Hanrahan & Grove, 1990b). Future research directions may require the use of these dimensions and their relationship to other elements of the SASS as well as performance.

How Does Explanatory Style Relate to Free Throw Performance?

It can be concluded by the results of this study that few elements of the SASS are found to relate to free throw shooting performance in either of the respective environments. When all subjects were examined, only locus of control with respect to positive events was found to statistically correlate with free throws in the practice environment. This relationship was so weak that it is considered practically insignificant. When the criterion subjects were examined, the optimism index showed a weak yet positive relationship with free throw shooting performance in the practice environment. Again, this figure is too weak for practical significance as well as predictive value.

An additional finding in this section of the study emerged. When the criterion subjects were examined, more SASS elements showed statistical significance in relation to free throws in the practice setting than in the competitive setting. These results show that explanatory style seems to be more of a factor in the practice setting than the competitive setting. Perhaps these may be outside or in concert with the situational and social factors noted by Brawley (1984).

Recommendations

The Sport Attributional Style Scale (SASS) requires additional validation literature to support justification for further use. Only the original authors have established reliability and construct validity. In addition to external validation research, the SASS may be altered for more sport-specific use as was done in this study. Should the SASS gain cross-validation across a variety of sports and strong correlations with sport performance, a version for each sport may be constructed and eventually utilized in practice.

Future research requires closer examination of the construct in relation to skills in other sports. As well, research directions may examine this and other constructs and how they exert their affect on performance in respective settings and situations.

Seligman (1991) has shown that a team's overall explanatory style can be measured and related to performance. The group situation requires a closer look from researchers. If predictive capabilities are established, perhaps coaches and sport psychologists can apply the construct into team dynamics, cohesion, and ultimately performance in the competitive arena.

Explanatory Style Variables Accounting for Free Throw Performance?

This study provides statistically significant results in determining which SASS elements account for the greatest degree of variance in free throw shooting performance in the respective settings. In can be concluded that the two locus dimensions and the stability dimension account for the greatest degree of variance in the practice setting. It can also be concluded that the stability and controllability dimensions account for the greatest degree of variance in the competitive setting. As with the previous section, these results are statistically significant, yet practically weak in accounting for and predicting free throw performance in either environment.

Recommendations

Up to this point, research has focused on attributional elements that are selected by individuals the most, and not the elements that affect performance. Yukelson, Weinberg, West, and Jackson (1981) point out that research in the area of attribution theory needs to focus on attributions and their relationship to subsequent behaviour. This study follows the antecedent-attribution-consequence approach. As a result, only inferences can be made to this study's relevance to previous research. More research needs to be done on the attribution cycle noted above. Research that focuses on the antecedent-attribution or the attribution-consequence approach does not sufficiently serve practical purposes. The complete approach will lend itself to practical transference.

Future research is necessary that focuses on the specific elements of explanatory style, how they relate to each other, and how they relate to absolute performance.

FUTURE DIRECTIONS

Extending the construct of explanatory style in future research may evolve specifically to the temporal order of successful and unsuccessful free throw attempts. Even more appealing to the coach and/or practitioner would be the last five minutes of a game with the score very close, and with great levels of perceived importance placed on the outcome. This scenario may increase the level of perceived pressure in the minds of the athletes and potentially allow for explanatory style tendencies and their effect to take a potentially more firm grip on the shooters.

Other potential research directions revolving around the focus on temporal order could be the potential predictability of performance immediately after a perceived or absolute poor performance. When athletes perform poorly (e.g. missed shots), how can coaches predict the chances of them making or missing the very next shot? Will the information provided by the explanatory style profile allow researchers to predict this outcome? More research is necessary to investigate this concept.

Of particular concern in future research may be the potential existence of the "athlete's profile". Seligman (1991) details the explanatory profile of the depressive individual as being overly internal, stable and global with respect to negative events, in combination with external, unstable and specific tendencies toward positive events. The overly optimistic individual will show tendencies to the opposite. Seligman notes that optimism is only good in moderation. Those individuals at the extreme end of the scale are said to be "blindly" optimistic. These people do not have a firm grasp of reality and will rarely take responsibility for their own negative behaviour (Seligman, 1991). Herein lies the paradox. Cox (1994) presents the hypothesis that the very nature of sport calls for an explanatory style profile that requires both ends of the optimism-pessimism continuum in concert. It is a common belief that coaches work very hard to develop athletes that will take a great deal of responsibility for their behaviour - good or bad - perhaps to an unrealistic level. This trait is seen as desirable and necessary for success in sport. Cox states that coaches want athletes to take responsibility for poor behaviour in combination with the belief that poor performances are unstable and specific. This, Cox believes, will create a strong motivational state within individuals. For example, athletes take responsibility for a poor performance, but realize they can change it, because it is only temporary and specific to the situation at hand. This makes intuitive sense. Future research is necessary at all levels of sport to determine the status of this "profile". Specifically, how does the status of the "athlete's profile" change and develop as athletes move up in skill and competitive levels?

Overall, explanatory style is a psychological construct that is intuitively appealing. If coaches and sport psychologists can account for performance variance through the measurement of explanatory style, and through a sound cognitive restructuring program, they can begin to systematically alter the athlete's attributional structure. In so doing, the athlete may be re-trained to think in non-negative or even positive terms. In turn, this may release the athlete from self-imposed limitations. The end result may ultimately be the enhancement of the athlete's performance.

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Appendix A
Letter to Coaches

<Coaches Name & Address>

Dear *<first name>*:

Thank you for agreeing to volunteer your student athletes for the benefit of my research. In this package are items that require your careful attention. I realize that time is one thing you do not have much of, so I'll streamline this as much as possible. I trust you will have enough time to sufficiently prepare to carry out the data collection while at the ACAC Pre-Season Tournament (Oct 31-Nov 2). If not, please notify me prior, and plan to administer the questionnaire during the week PRIOR to the Tournament.

In this package you will find the following:

A. the designated number of copies of the Sport Attributional Style Scale (SASS)
   - complete with instructions on the cover (note that it is called the Sport Situation Reaction Survey on the cover - please ignore this)
B. the designated number of copies of the informed consent form
   - for those players on your team that are 18 years of age or OVER
C. the designated number of copies of the parental/guardian consent form
   - for those players on your team that are UNDER 18 years of age at the time of completion of the SASS
D. the designated number of free throw tally sheets
E. instructions for the coach on shooting and collecting the free throw data
F. instructions for the coach on administering the SASS questionnaire
G. a self-addressed, stamped envelope for return mailing

Below is an outline of what I would like you to do:

1. access a classroom or meeting room where your athletes can complete the SASS
   - preferably while at the preseason tournament (allow 30 minutes)
   - OR during the week prior to the preseason tournament (if more convenient for you and your team)
2. have designated players complete the informed consent form
   - those 18 years of age or over - those UNDER 18 must have parental/guardian consent prior
3. distribute the SASS and have the players read the instructions
   - ensure all understand, and answer questions if necessary prior to beginning
4. instruct the players to begin and complete the SASS
   - this should take approximately 20-30 minutes
5. gather the completed questionnaires

I will contact you at a date prior to administrating the SASS. At this time I will answer any specific questions you may have regarding the administration of the SASS.

6. gather your players in a gymnasium, and, following the enclosed instructions on the

tally sheets, have each player shoot 100 free throws consecutively (BE SURE TO SHOOT THE FREE THROWS **AFTER** THE STUDENT ATHLETES HAVE COMPLETED THE QUESTIONNAIRE)

7. gather the completed free throw tally sheets, and mail these along with the completed questionnaires to me at your earliest convenience
   - use the self-addressed, stamped envelope enclosed in your package

As I mentioned in our phone conversation, I will return the results to you immediately upon compilation. I'm sure you will agree that the findings of a study such as this will have positive implications for you and your team. Do not hesitate to call me at Mount Royal College (direct line: 240-7211) if you have any questions, comments, concerns or problems. Thank you again for supporting me in my research and Good Luck with the season.

Sincerely,

K.A. Larson

Appendix B
Informed Consent Form (student athlete)

EXPLANATION OF STUDY

Faculty of Physical Education and Recreation
University of Alberta

Title: An Examination of Explanatory Style in Male Basketball Players

The purpose of this study is to examine the construct of explanatory style in male basketball players during the 1996-97 Alberta Colleges Athletic Conference (ACAC) competitive season. Specifically, this study will look at the relationship between explanatory style and free throw performance.

The Sport Attributional Style Scale (SASS; Hanrahan & Grove, 1989) will be used as a means of assessing explanatory style. Subjects will be male only. Estimated time of involvement with completing the SASS will be approximately 20-30 minutes. Estimated time of involvement for the purposes of shooting free throws will be approximately 45 minutes per team.

Participation in this study will involve completion of the SASS as well as shooting 100 free throws consecutively.

All information will be kept confidential. Only the investigators will have access to the coded results. SASS scores will be forwarded to the coach upon completion of the findings.

If there are any questions at any time, please do not hesitate to contact either of the investigators by telephone, e-mail and/or fax.

Date: ____________	Investigator:	K.A. Larson Phone: (403) 240-7211 E-mail: klarson@mtroyal.ab.ca Fax: (403) 240-7227	Advisor: Dr. J. Hogg (403) 492-3839 jhogg@per.ualberta.ca

---

INFORMED CONSENT

I,____________________________________,acknowledge that I have read the description of the experiment and understand the test procedure to be performed and I give my consent for participation. I acknowledge receipt of a copy of the consent form. I understand that I am free to withdraw consent and to discontinue participation in the project at any time without any prejudice to myself.

Date: ________________ Signature: ________________________________

Witness: ________________________________

Signature: ________________________________

Appendix C
Informed Consent Form (parent/guardian)

Dear Parent/Guardian:

Your son has been selected to participate in a research study at the University of Alberta. The purpose of the study is to examine the construct of explanatory style in male basketball players. Explanatory Style is the manner in which individuals explain to themselves why both good and bad events happen to them. The method of assessment will be the Sport Attributional Style Scale (SASS; Hanrahan & Grove, 1989) and will take approximately 20-30 minutes of your son's time. **Confidentiality of results is strictly guaranteed.**

In order to make sure that we are operating with your understanding and consent, we would appreciate your cooperation in completing the bottom of this letter.

If you have any questions at any time, please do not hesitate to contact either of the investigators by telephone, fax, or e-mail.

Cordially,

____

K.A. Larson
Phone: (403) 240-7211
Fax: (403) 240-7227
E-mail: klarson@mtroyal.ab.ca

Advisor: Dr. J. Hogg
(403) 492-2831
jhogg@per.ualberta.ca

INFORMED CONSENT

______________________________ (your son), who is to be tested, has my permission to participate in the study. I understand that the results will be coded, **confidential**, and used in the analysis of this study. I understand that at any time I, or my son, may choose to withdraw consent and discontinue participation in the project without prejudice to myself or my son. I acknowledge receipt of a copy of the consent form.

Name: ______________________________ Date: ____________________

Address: ______________________________ City: ____________________

Phone Number: ______________________________

______________________________ ______________________________
Signature Signature

ONLY ONE SIGNATURE IS NECESSARY

Appendix D
Instructions on Administering the SASS

ADMINISTERING THE SPORT ATTRIBUTIONAL STYLE SCALE (SASS)

Coach, please follow these instructions carefully...

1. Do **NOT** submit (or hand out) the SASS to your student athletes until they have completed and returned the consent forms.

2. Administer the SASS while at the ACAC Preseason Tournament some time **before** a practice or game situation (OR during the week prior to the tournament, if necessary) to avoid potential problems in response set.

3. Have all the student athletes together in a classroom sitting comfortably with a pencil in hand. NO TALKING PLEASE!

4. Distribute the consent forms and have the student athletes read them carefully and sign. Collect these. Please sign them yourself as the "witness" while you are waiting for them to complete the SASS.

Please note: Have the parent/guardian of the student athletes under 18 years of age sign the parental/guardian consent form prior to completion of the SASS. Collect these. If the parent and/or guardian is not available you as the coach may have to sign in proxy.

5. Hand out the SASS questionnaires and instruct as follows...

✓ This is **NOT** a test. It is a questionnaire. There are no **RIGHT** or **WRONG** answers.

✓ Please respond honestly.

✓ Read the instructions carefully and be sure you fully understand them.

✓ Use your imagination and choose a cause that **YOU** feel is the *single most likely*.

✓ Be sure to enter your name (please print) and the team you play for at the top of the first page.

Coach, please collect the SASS questionnaires and send them and the free throw tally sheets back to me in the self-addressed, stamped envelope.

Thank you once again. If all goes according to plan, you should see the results of this research prior to the end of this season - perhaps in time for you to use the information in your coaching.

Appendix E
Sport Attributional Style Scale

SPORT SITUATION REACTION SURVEY

Name: ______________________ *Team:* ______________________

Instructions

This questionnaire describes several positive and negative events in sport. Please try to vividly imagine yourself in each situation. If such an event happened to you, what would have caused it? While events may have many causes, we want you to pick only one - *the single most likely cause* as if the event actually happened to you. Please write this cause in the blank provided. Then answer some questions about the cause, and about the event. To summarize, we want you to:

1. Read each event carefully and vividly imagine it happened to YOU. Keep this in mind while determining the cause and answering the questions about the cause and the event.
2. Decide what YOU feel would be the single most likely cause of the event.
3. Write down the most likely cause in the blank provided.
4. Answer five questions about the cause (questions 2 through 6).
5. Answer two questions about the event (questions 7 & 8).
6. Go to the next event. *(NO TALKING PLEASE!)*

Treat each event independently, trying to vividly imagine yourself involved in that situation. Then, answer the questions as they apply to how YOU would feel. Please note that you can use any part of the rating scale when answering a question. The labels at each end of the scale are only for your guidance. *Make sure that your answers accurately reflect how YOU feel*.

Please Begin!

This questionnaire is being used with prior written permission of the co-author:

J. Robert Grove, PhD.
Senior Lecturer
Exercise and Sport Psychology
Department of Human Movement
The University of Western Australia
Nedlands, Perth, Western Australia 6009

EVENT #1 **You have NO DIFFICULTY withstanding a demanding basketball training session.**

---

1. **Write down the single most likely cause:** ______________________________

2. **Is the cause of the training session being easy for you to withstand, due to something about you, or something about other people or circumstances? (circle one number)**

Totally due to other people or circumstances					Totally due to me	
1	2	3	4	5	6	7

3. **In the future when you are training, will this cause be present again? (circle one number)**

Will never again be present					Will always be present	
1	2	3	4	5	6	7

4. **Is the cause something that just influences how easy training is for you to withstand, or does it also influence other areas of your life? (circle one number)**

Influences just this particular event					Influences all my life events	
1	2	3	4	5	6	7

5. **Is the cause something that is controllable by you or others, or is it uncontrollable? (circle one number)**

Controllable					Uncontrollable	
1	2	3	4	5	6	7

6. **Is the cause something that is intentional or unintentional? (circle one number)**

Intentional					Unintentional	
1	2	3	4	5	6	7

7. **How important would this event be if it happened to you? (circle one number)**

Not at all important					Extremely important	
1	2	3	4	5	6	7

8. **How clearly were you able to imagine this event happening to you? (circle one number)**

Not at all clearly					Very clearly	
1	2	3	4	5	6	7

EVENT #2 You are NOT SELECTED to the starting line up for an important basketball game.

---

1. **Write down the single most likely cause:** ______________________________

2. **Is the cause of your not being selected to the starting line up due to something about you, or something about other people or circumstances? (circle one number)**

Totally due to other people or circumstances — **Totally due to me**

1 *2* *3* *4* *5* *6* *7*

3. **In the future when a starting line up is selected, will this cause be present again? (circle one number)**

Will never again be present — **Will always be present**

1 *2* *3* *4* *5* *6* *7*

4. **Is the cause something that just influences whether or not you get selected to the starting line up, or does it also influence other areas of your life? (circle one number)**

Influences just this particular event — **Influences all my life events**

1 *2* *3* *4* *5* *6* *7*

5. **Is the cause something that is controllable by you or others, or is it uncontrollable? (circle one number)**

Controllable — **Uncontrollable**

1 *2* *3* *4* *5* *6* *7*

6. **Is the cause something that is intentional or unintentional? (circle one number)**

Intentional — **Unintentional**

1 *2* *3* *4* *5* *6* *7*

7. **How important would this event be if it happened to you? (circle one number)**

Not at all important — **Extremely important**

1 *2* *3* *4* *5* *6* *7*

8. **How clearly were you able to imagine this event happening to you? (circle one number)**

Not at all clearly — **Very clearly**

1 *2* *3* *4* *5* *6* *7*

EVENT #3 Your team-mates claim that you are a VERY GOOD basketball player.

---

1. **Write down the single most likely cause: ____________________________________**

2. **Is the cause of your team-mates claiming you are a very good basketball player due to something about you, or something about other people or circumstances? (circle one number)**

Totally due to other people or circumstances					**Totally due to me**	
1	*2*	*3*	*4*	*5*	*6*	*7*

3. **In the future when your team-mates are talking about your performance in basketball, will this cause be present again? (circle one number)**

Will never again be present					**Will always be present**	
1	*2*	*3*	*4*	*5*	*6*	*7*

4. **Is the cause something that just influences how your team-mates refer to your performance in basketball, or does it also influence other areas of your life? (circle one number)**

Influences just this particular event					**Influences all my life events**	
1	*2*	*3*	*4*	*5*	*6*	*7*

5. **Is the cause something that is controllable by you or others, or is it uncontrollable? (circle one number)**

Controllable					**Uncontrollable**	
1	*2*	*3*	*4*	*5*	*6*	*7*

6. **Is the cause something that is intentional or unintentional? (circle one number)**

Intentional					**Unintentional**	
1	*2*	*3*	*4*	*5*	*6*	*7*

7. **How important would this event be if it happened to you? (circle one number)**

Not at all important					**Extremely important**	
1	*2*	*3*	*4*	*5*	*6*	*7*

8. **How clearly were you able to imagine this event happening to you? (circle one number)**

Not at all clearly					**Very clearly**	
1	*2*	*3*	*4*	*5*	*6*	*7*

EVENT #4 **You perform VERY POORLY in a basketball game.**

---

1. **Write down the single most likely cause:** ______________________________

2. **Is the cause of your poor performance due to something about you, or something about other people or circumstances? (circle one number)**

Totally due to other people or circumstances					Totally due to me	
1	2	3	4	5	6	7

3. **In the future when performing in a basketball game, will this cause be present again? (circle one number)**

Will never again be present					Will always be present	
1	2	3	4	5	6	7

4. **Is the cause something that just influences your performance in basketball games, or does it also influence other areas of your life? (circle one number)**

Influences just this particular event					Influences all my life events	
1	2	3	4	5	6	7

5. **Is the cause something that is controllable by you or others, or is it uncontrollable? (circle one number)**

Controllable					Uncontrollable	
1	2	3	4	5	6	7

6. **Is the cause something that is intentional or unintentional? (circle one number)**

Intentional					Unintentional	
1	2	3	4	5	6	7

7. **How important would this event be if it happened to you? (circle one number)**

Not at all important					Extremely important	
1	2	3	4	5	6	7

8. **How clearly were you able to imagine this event happening to you? (circle one number)**

Not at all clearly					Very clearly	
1	2	3	4	5	6	7

EVENT #5 **The coach COMPLIMENTS your performance in a basketball game.**

---

1. **Write down the single most likely cause: ____________________________________**

2. **Is the cause of the coach complimenting you due to something about you, or something about other people or circumstances? (circle one number)**

Totally due to other people or circumstances					Totally due to me	
1	*2*	*3*	*4*	*5*	*6*	*7*

3. **In the future when the coach compliments you, will this cause be present again? (circle one number)**

Will never again be present					Will always be present	
1	*2*	*3*	*4*	*5*	*6*	*7*

4. **Is the cause something that just influences your coach's comments, or does it also influence other areas of your life? (circle one number)**

Influences just this particular event					Influences all my life events	
1	*2*	*3*	*4*	*5*	*6*	*7*

5. **Is the cause something that is controllable by you or others, or is it uncontrollable? (circle one number)**

Controllable					Uncontrollable	
1	*2*	*3*	*4*	*5*	*6*	*7*

6. **Is the cause something that is intentional or unintentional? (circle one number)**

Intentional					Unintentional	
1	*2*	*3*	*4*	*5*	*6*	*7*

7. **How important would this event be if it happened to you? (circle one number)**

Not at all important					Extremely important	
1	*2*	*3*	*4*	*5*	*6*	*7*

8. **How clearly were you able to imagine this event happening to you? (circle one number)**

Not at all clearly					Very clearly	
1	*2*	*3*	*4*	*5*	*6*	*7*

EVENT #6 **You have GREAT DIFFICULTY withstanding a demanding basketball training session.**

---

1. Write down the single most likely cause: ______________________________

2. Is the cause of training being difficult for you to withstand, due to something about you, or something about other people or circumstances? (circle one number)

Totally due to other people or circumstances					Totally due to me	
1	2	3	4	5	6	7

3. In the future when you are training, will this cause be present again? (circle one number)

Will never again be present					Will always be present	
1	2	3	4	5	6	7

4. Is the cause something that just influences how difficult training is for you to withstand, or does it also influence other areas of your life? (circle one number)

Influences just this particular event					Influences all my life events	
1	2	3	4	5	6	7

5. Is the cause something that is controllable by you or others, or is it uncontrollable? (circle one number)

Controllable					Uncontrollable	
1	2	3	4	5	6	7

6. Is the cause something that is intentional or unintentional? (circle one number)

Intentional					Unintentional	
1	2	3	4	5	6	7

7. How important would this event be if it happened to you? (circle one number)

Not at all important					Extremely important	
1	2	3	4	5	6	7

8. How clearly were you able to imagine this event happening to you? (circle one number)

Not at all clearly					Very clearly	
1	2	3	4	5	6	7

EVENT #7 **You are SELECTED to the starting line up for an important basketball game.**

---

1. Write down the single most likely cause: ____________________________

2. Is the cause of your being selected to the starting line up due to something about you, or something about other people or circumstances? (circle one number)

Totally due to other people or circumstances					Totally due to me	
1	*2*	*3*	*4*	*5*	*6*	*7*

3. In the future when a starting line up is selected, will this cause be present again? (circle one number)

Will never again be present					Will always be present	
1	*2*	*3*	*4*	*5*	*6*	*7*

4. Is the cause something that just influences whether or not you get selected to the starting line up, or does it also influence other areas of your life? (circle one number)

Influences just this particular event					Influences all my life events	
1	*2*	*3*	*4*	*5*	*6*	*7*

5. Is the cause something that is controllable by you or others, or is it uncontrollable? (circle one number)

Controllable					Uncontrollable	
1	*2*	*3*	*4*	*5*	*6*	*7*

6. Is the cause something that is intentional or unintentional? (circle one number)

Intentional					Unintentional	
1	*2*	*3*	*4*	*5*	*6*	*7*

7. How important would this event be if it happened to you? (circle one number)

Not at all important					Extremely important	
1	*2*	*3*	*4*	*5*	*6*	*7*

8. How clearly were you able to imagine this event happening to you? (circle one number)

Not at all clearly					Very clearly	
1	*2*	*3*	*4*	*5*	*6*	*7*

EVENT #8 **Your team-mates claim that you are NOT a good basketball player.**

---

1. Write down the single most likely cause: ______________________________

2. Is the cause of your team-mates claiming you are NOT a good basketball player due to something about you, or something about other people or circumstances? (circle one number)

Totally due to other people or circumstances — Totally due to me

1 *2* *3* *4* *5* *6* *7*

3. In the future when your team-mates are talking about your performance in basketball, will this cause be present again? (circle one number)

Will never again be present — Will always be present

1 *2* *3* *4* *5* *6* *7*

4. Is the cause something that just influences how your team-mates refer to your performance in basketball, or does it also influence other areas of your life? (circle one number)

Influences just this particular event — Influences all my life events

1 *2* *3* *4* *5* *6* *7*

5. Is the cause something that is controllable by you or others, or is it uncontrollable? (circle one number)

Controllable — Uncontrollable

1 *2* *3* *4* *5* *6* *7*

6. Is the cause something that is intentional or unintentional? (circle one number)

Intentional — Unintentional

1 *2* *3* *4* *5* *6* *7*

7. How important would this event be if it happened to you? (circle one number)

Not at all important — Extremely important

1 *2* *3* *4* *5* *6* *7*

8. How clearly were you able to imagine this event happening to you? (circle one number)

Not at all clearly — Very clearly

1 *2* *3* *4* *5* *6* *7*

EVENT #9 **You perform VERY WELL in a basketball game.**

---

1. Write down the single most likely cause: ______________________________

2. Is the cause of your good performance due to something about you, or something about other people or circumstances? (circle one number)

Totally due to other people or circumstances					Totally due to me	
1	*2*	*3*	*4*	*5*	*6*	*7*

3. In the future when performing in a basketball game, will this cause be present again? (circle one number)

Will never again be present					Will always be present	
1	*2*	*3*	*4*	*5*	*6*	*7*

4. Is the cause something that just influences your performance in basketball games, or does it also influence other areas of your life? (circle one number)

Influences just this particular event					Influences all my life events	
1	*2*	*3*	*4*	*5*	*6*	*7*

5. Is the cause something that is controllable by you or others, or is it uncontrollable? (circle one number)

Controllable					Uncontrollable	
1	*2*	*3*	*4*	*5*	*6*	*7*

6. Is the cause something that is intentional or unintentional? (circle one number)

Intentional					Unintentional	
1	*2*	*3*	*4*	*5*	*6*	*7*

7. How important would this event be if it happened to you? (circle one number)

Not at all important					Extremely important	
1	*2*	*3*	*4*	*5*	*6*	*7*

8. How clearly were you able to imagine this event happening to you? (circle one number)

Not at all clearly					Very clearly	
1	*2*	*3*	*4*	*5*	*6*	*7*

EVENT #10 **The coach CRITICIZES your performance in a basketball game.**

---

1. Write down the single most likely cause: ______________________________

2. Is the cause of the coach criticizing you due to something about you, or something about other people or circumstances? (circle one number)

Totally due to other people or circumstances					Totally due to me	
1	2	3	4	5	6	7

3. In the future when the coach criticizes you, will this cause be present again? (circle one number)

Will never again be present					Will always be present	
1	2	3	4	5	6	7

4. Is the cause something that just influences your coach's comments, or does it also influence other areas of your life? (circle one number)

Influences just this particular event					Influences all my life events	
1	2	3	4	5	6	7

5. Is the cause something that is controllable by you or others, or is it uncontrollable? (circle one number)

Controllable					Uncontrollable	
1	2	3	4	5	6	7

6. Is the cause something that is intentional or unintentional? (circle one number)

Intentional					Unintentional	
1	2	3	4	5	6	7

7. How important would this event be if it happened to you? (circle one number)

Not at all important					Extremely important	
1	2	3	4	5	6	7

8. How clearly were you able to imagine this event happening to you? (circle one number)

Not at all clearly					Very clearly	
1	2	3	4	5	6	7

Appendix F
Instructions on Shooting and Collecting Free Throw Data

SHOOTING AND COLLECTING FREE THROW DATA

Coach, please follow these instructions carefully...

1. Gather your student athletes together and briefly explain the task. Divide the players into groups of three. Hand out the tally sheets, pencils and clipboards (if necessary). Ensure that the players names are on the tally sheets prior to distribution, and that the correct free throw records are made on the appropriate corresponding sheet.

2. Instruct the players to TRY THEIR VERY BEST to make EVERY shot possible. Try your best to make it a team competition - "This is an ACAC Free Throw Shooting Contest! They must place importance on the exercise in order to add as much validity as possible. If they do not feel it is a competition, then their cognitive tendencies may not surface and influence the results - this, of course, is one of the objectives of the study. This concept of "competition" and simulated "pressure" is fundamental to the potential success and validity of the study.

3. Note that the directions are on the tally sheets: *Use a pencil - Mark a ✓ for a MADE free throw - Mark a 0 for a MISSED free throw - Be sure to record chronologically! - BE ACCURATE!*

4. Remind all players that accuracy in recording is essential and that each player MUST SHOOT 100 CONSECUTIVE FREE THROWS. It is also important to note that the player's NORMAL ROUTINE must be executed after EACH free throw. After each and every free throw, have the player step back out of the free throw shooter's area, and then back in again for the next shot. At this point the player should do what he NORMALLY does when shooting a free throw in a game (i.e.: number of bounces, time spent focusing, normal thoughts, etc.). This may add a few minutes onto the exercise, but it will assist greatly in allowing the player's thoughts and tendencies to have an affect on the next free throw. Note: If all student athletes stay on task and shoot according to the instructions, this exercise should only take approximately 45 minutes (or less).

5. Use four baskets with one group of three players at each (or a fifth basket if you have more than 12 players). One player shoots, one rebounds and the other records the chronology of made and missed free throws. Use only one basketball per basket. Have the rebounder assist the recorder and note whether or not the shot was made. This may help with the accuracy in recording. Have them rotate after each player shoots his 100 consecutive free throws until each of the three is done.

6. Once all players have shot their 100 consecutive free throws, please collect the tally sheets.

7. Group the tally sheets together and put them in the self-addressed, stamped envelope along with the completed SASS questionnaires.

Thank you once again. If all goes according to plan, you should see the results of this research prior to the end of this season - perhaps in time for you to use the information in your coaching.

Appendix G
Free Throw Tally Sheets - Practice Environment

Name: ________________________ **Team:** ______________________________

Free Throw Set	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
First set of 20																				
Second set of 20																				
Third set of 20																				
Fourth set of 20																				
Fifth set of 20																				

Use a pencil - Mark a ✓ for a made free throw - Mark a 0 for a missed free throw - Be sure to stay chronological!

Name: ________________________ **Team:** ______________________________

Free Throw Set	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
First set of 20																				
Second set of 20																				
Third set of 20																				
Fourth set of 20																				
Fifth set of 20																				

Use a pencil - Mark a ✓ for a made free throw - Mark a 0 for a missed free throw - Be sure to stay chronological!

Name: ________________________ **Team:** ______________________________

Free Throw Set	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
First set of 20																				
Second set of 20																				
Third set of 20																				
Fourth set of 20																				
Fifth set of 20																				

Use a pencil - Mark a ✓ for a made free throw - Mark a 0 for a missed free throw - Be sure to stay chronological!

Name: ________________________ **Team:** ______________________________

Free Throw Set	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
First set of 20																				
Second set of 20																				
Third set of 20																				
Fourth set of 20																				
Fifth set of 20																				

Use a pencil - Mark a ✓ for a made free throw - Mark a 0 for a missed free throw - Be sure to stay chronological!

Appendix H
SASS Spreadsheet Sample

Event	Question #1 Single Most Likely CAUSE	Q2	Q3	Q4	*Sum*	Q5	Q6	Q7	Q8
1	mentally tough	7	7	1	*15*	2	4	6	3
2	no legitimate reason	1	4	7	*12*	4	4	7	1
3	they aren't so good	6	7	4	*17*	4	4	1	7
4	illness	4	4	7	*15*	4	7	7	7
5	played well	5	5	4	*14*	3	1	5	7
6	illness	4	3	7	*14*	4	7	7	7
7	coaches decision	6	6	4	*16*	4	1	1	7
8	taking their playing time	4	4	1	*9*	5	4	1	1
9	uncanny scorer	5	5	1	*11*	1	1	1	7
10	looking for a scapegoat	4	5	4	*13*	4	1	1	1

Internality/stability/globality for NEGATIVE event explanations (higher = greater pessimism)	**63**	(range = 15-105)
Externality/instability/specificity for POSITIVE event explanations (higher = greater pessimism)	**47**	(range = 15-105)
Externality/instability/specificity for NEGATIVE event explanations (higher = greater optimism)	**57**	(range = 15-105)
Internality/stability/globality for POSITIVE event explanations (higher = greater optimism)	**73**	(range = 15-105)
Controllability for NEGATIVE event explanations (higher = less control)	**21**	(range = 5-35)
Controllability for POSITIVE event explanations (higher = less control)	**14**	(range = 5-35)
Intentionality for NEGATIVE event explanations (higher = less intentionality)	**23**	(range = 5-35)
Intentionality for POSITIVE event explanations (higher = less intentionality)	**11**	(range = 5-35)
Importance for NEGATIVE event explanations (higher = greater importance)	**23**	(range = 5-35)
Importance for POSITIVE event explanations (higher = greater importance)	**14**	(range = 5-35)
Image clarity for NEGATIVE event explanations (higher = greater clarity)	**17**	(range = 5-35)
Image clarity for POSITIVE event explanations (higher = greater clarity)	**31**	(range = 5-35)
Pessimistic Explanatory Style	**110**	(range = 30-210)
Optimistic Explanatory Style	**130**	(range = 30-210)

Appendix I
Summary of SASS Scoring Procedures

J. Robert Grove
Department of Human Movement, The University of Western Australia
(re-printed with permission from the author)

Scoring

There are several scoring options for the Sport Attributional Style Scale (Hanrahan, Grove & Hattie, 1989). The one that is selected will ultimately depend on the nature of the research.

Dimensional approach If you are interested in the relationship of a given attributional dimension to other behaviors, then the ratings for that dimension are simply summed across items to arrive at a dimension-specific subscale score. You might, for example, be interested in the relationship between perceived control and level of aspiration in sport. A total score on the control dimension (summed across items) could therefore be correlated with a measure of "ultimate goals" to address this issue. Similar subscale scores could be calculated for other attributional dimensions (internality, stability, etc.) if they were relevant to the research question. Indeed, it is probably necessary to calculate these additional scores in order to statistically control for inter-correlations among dimensions when making comparisons (Anderson & Deuser, 1991, 1993; Carver, 1989).

Composite Indices Composite scores involving several attributional dimensions can also be calculated from the SASS. The learned helplessness model, for example, states that a "pessimistic explanatory style" has negative consequences for a variety of emotional and motivational parameters. Pessimistic explanatory style is defined as a tendency to use internal, stable and global attributions to explain negative events and external, unstable, and specific attributions to explain positive events. Peterson and colleagues (Peterson et al., 1982; Peterson & Villanova, 1988) use an additive approach to calculating a composite score, but several investigators have questioned this procedure (e.g., Anderson & Deuser, 1991, 1993; Carver, 1989; Carver & Scheier, 1991). Researchers should become familiar with the arguments for and against the use of composite indices when contemplating this approach.

If an additive composite index is desired, a score for explanatory pessimism can be calculated by adding the internality, stability, and globality ratings for positive SASS items to the externality, instability, and specificity ratings for negative SASS items. Because the rating scales are set up with higher values near the internal/stable/global ends of the scales, reverse scoring is required for the positive items in calculating this composite index. Recoding of positive items is also required if a multiplicative approach is used (cf., Anderson & Deuser, 1991), but the subscale scores would be multiplied rather than added.

Tables and Notes The enclosed tables list the items in the short form of the SASS and summarize the procedures for calculating an additive composite index of explanatory pessimism. Other theorists emphasize different dimensions and/or advocate the use of alternative indices (e.g., Anderson & Deuser, 1993; Weiner, 1986), so we present this information only as an illustration of one possible approach to using the SASS for research purposes.

Please note that the rating scales for the control and intentionality dimensions are anchored such that higher numbers indicate less control and less intentionality. It may be desirable/necessary to recode (reverse score) these dimensions prior to correlating them with a criterion measure or prior to combining them with other dimensions in a composite index.

Note also that each SASS item contains rating scales for event importance and image clarity. These scales are included to assess factors that we believe might mediate the strength of relationships between attributional dimensions and certain criterion variables. You may want to omit them if they are not relevant to your research question.

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Appendix J
Items Comprising the Short Form of the SASS
(Hanrahan & Grove, 1990)

Basketball-Specific Changes Made to the Sport Attributional Style Scale

---

1. You have no difficulty withstanding a demanding training session.
Changed to: You have NO DIFFICULTY withstanding a demanding basketball training session.

2. You are not selected for the starting team in an important competition.
Changed to: You are NOT SELECTED to the starting line up for an important basketball game.

3. Your teammates claim that you are a very good player.
Changed to: Your teammates claim that you are a VERY GOOD basketball player.

4. You perform very poorly in a competition.
Changed to: You perform VERY POORLY in a basketball game.

5. The coach compliments your performance.
Changed to: The coach COMPLIMENTS your performance in a basketball game.

6. You have great difficulty withstanding a demanding training session.
Changed to: You have GREAT DIFFICULTY withstanding a demanding basketball training session.

7. You are selected for the starting team in an important competition.
Changed to: You are SELECTED to the starting line up for an important basketball game.

8. Your teammates claim that you are not a very good performer.
Changed to: Your teammates claim that you are NOT a good basketball player.

9. You perform very well in a competition.
Changed to: You perform VERY WELL in a basketball game.

10. The coach criticizes your performance.
Changed to: The coach CRITICIZES your performance in a basketball game.

Appendix K
Calculating the SASS Composite Indices

Using the Short Form of the Sport Attributional Style Scale
(Grove, 1989)

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1. Determining the degree of internality, stability, and globality for negative and positive event explanations.

   (a) For explanatory pessimism with respect to negative events, this is accomplished by summing the raw numerical ratings for all three dimensions across items 2, 4, 6, 8, and 10. The summation involves 15 separate numbers (5 items X 3 dimensional ratings per item) and produces a composite score for negative event pessimism. This score can range from 15-105, with higher scores indicating greater explanatory pessimism for negative events.

   (b) For explanatory optimism with respect to positive events, the same would be done for the degree of internality, stability, and globality for positive event explanations by summing the raw numerical ratings for all three dimensions across items 1, 3, 5, 7, and 9. The summation produces a composite score for positive event optimism. This score will also range from 15-105, with higher scores indicating greater explanatory optimism for positive events.

2. Determining the degree of externality, instability, and specificity for event explanations.

   (a) For explanatory pessimism with respect to positive events, it is necessary to recode (reverse) the numerical ratings provided for the five positive items. Recoding is accomplished by setting 7=1, 6=2, 5=3, 4=4, 3=5, 2=6, and 1=7 for ratings on items 1, 3, 5, 7, and 9. Summation of the recoded values produces a composite score for positive event pessimism (recoding can also be done by subtracting the summed score from 120). This score can range from 15-105, with higher scores indicating greater explanatory pessimism for positive events.

   (b) For explanatory optimism with respect to negative events, the same can be done by recoding (reversing) the numerical ratings provided for the five negative items (2, 4, 6, 8, and 10). Summation of the recoded values produces a composite score for negative event optimism (recoding can also be done by subtracting the summed score from 120). This score can range from 15-105, with higher scores indicating greater explanatory pessimism for positive events.

3. Determining the overall score for explanatory pessimism is accomplished by adding the value obtained in step 1(a) to the value obtained in step 2(a). This score can range from 30 to 210, with higher values indicating greater overall pessimism.

4. Determining the overall score for explanatory optimism is accomplished by adding the value obtained in step 1(b) to the value obtained in step 2(b). This score can range from 30 to 210, with higher values indicating greater overall optimism.

Appendix L
Correlation Table - All Subjects

Pearson Product-Moment Correlations
All Variables - All Subjects
Practice and Competitive Environments
N = 129, * = .05, ** = .01

	r	r	significance - two tailed	
	FTC	FTP	FTC	FTP
Optimism Index	0.036	0.138	0.686	0.118
Pessimism Index	-0.036	-0.138	0.686	0.118
Internality of Negative Basketball Event Explanations	0.077	0.012	0.388	0.894
Internality of Positive Basketball Event Explanations	0.118	**0.200	0.184	0.023
Stability of Negative Basketball Event Explanations	-0.045	-0.134	0.611	0.130
Stability of Positive Basketball Event Explanations	0.018	0.011	0.840	0.898
Globality of Negative Basketball Event Explanations	0.070	0.039	0.433	0.661
Globality of Positive Basketball Event Explanations	0.084	0.081	0.341	0.364
Internality/Stability/Globality of Negative Basketball Event Explanations	0.050	-0.043	0.577	0.632
Internality/Stability/Globality of Positive Basketball Event Explanations	0.103	0.132	0.248	0.137
Externality/Instability/Specificity of Negative Basketball Event Explanations	-0.050	0.043	0.577	0.632
Externality/Instability/Specificity of Positive Basketball Event Explanations	-0.103	-0.132	0.248	0.137
Controllability of Negative Basketball Event Explanations	0.056	0.006	0.526	0.949
Controllability of Positive Basketball Event Explanations	-0.022	0.035	0.803	0.697
Intentionality of Negative Basketball Event Explanations	-0.005	-0.083	0.953	0.350
Intentionality of Positive Basketball Event Explanations	-0.093	-0.061	0.293	0.491
Importance of Negative Basketball Event Explanations	0.085	-0.007	0.339	0.934
Importance of Positive Basketball Event Explanations	-0.004	0.021	0.962	0.817
Image Clarity of Negative Basketball Event Explanations	-0.037	-0.008	0.681	0.929
Image Clarity of Positive Basketball Event Explanations	0.096	-0.017	0.280	0.853
Free Throws in the Competitive Environment (FTC)	1.000	*0.212	.	0.016
Free Throws in the Practice Environment (FTP)	*0.212	1.000	0.016	.

Appendix M
Correlation Table - Criterion Subjects

Pearson Product-Moment Correlations
All Variables - Criterion Subjects
Practice and Competitive Environments
N = 68, * = .05, ** = .01

	r	r	significance - two tailed	
	FTC	FTP	FTC	FTP
Optimism Index	0.210	**0.334	0.086	0.005
Pessimism Index	-0.210	**-0.334	0.086	0.005
Internality of Negative Basketball Event Explanations	-0.007	-0.182	0.957	0.137
Internality of Positive Basketball Event Explanations	0.103	*0.281	0.402	0.020
Stability of Negative Basketball Event Explanations	*-0.281	*-0.300	0.020	0.013
Stability of Positive Basketball Event Explanations	-0.038	-0.007	0.757	0.956
Globality of Negative Basketball Event Explanations	-0.000	0.008	0.995	0.949
Globality of Positive Basketball Event Explanations	0.032	-0.057	0.796	0.644
Internality/Stability/Globality of Negative Basketball Event Explanations	-0.179	*-0.270	0.145	0.026
Internality/Stability/Globality of Positive Basketball Event Explanations	0.056	0.105	0.652	0.394
Externality/Instability/Specificity of Negative Basketball Event Explanations	0.179	0.270	0.145	0.026
Externality/Instability/Specificity of Positive Basketball Event Explanations	-0.056	-0.105	0.652	0.394
Controllability of Negative Basketball Event Explanations	0.181	-0.080	0.140	0.517
Controllability of Positive Basketball Event Explanations	0.024	-0.120	0.846	0.330
Intentionality of Negative Basketball Event Explanations	0.075	0.015	0.543	0.900
Intentionality of Positive Basketball Event Explanations	-0.032	-0.150	0.798	0.221
Importance of Negative Basketball Event Explanations	0.070	0.053	0.571	0.666
Importance of Positive Basketball Event Explanations	-0.041	-0.067	0.742	0.589
Image Clarity of Negative Basketball Event Explanations	0.068	0.040	0.582	0.745
Image Clarity of Positive Basketball Event Explanations	0.123	0.059	0.318	0.634
Free Throws in the Competitive Environment (FTC)	1.000	**0.502	.	0.000
Free Throws in the Practice Environment (FTP)	**0.502	1.000	0.000	.